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Rail-Road News.

First Australian Railway.

The Sydney Morning Herald of the 4th July contains a long account of the festivities attendant on the turning of the first turf of the first Australian railway. The ceremony was performed at Sydney on the 3rd of July, by the Hon. Mrs. Keith Stewart, the daughter of Sir C. A. Fitzroy, governor of New South Wales. Although the rain fell in torrents, thousands assembled to witness the interesting ceremony, and many strangers from the interior visited Sydney, for the purpose of participating in the fete. Dinner was provided in a large tent, the governor, Mrs. Stewart, the principle government officials, the directors of the railway, and many other ladies and gentlemen of distinction being present. The railway when completed, will extend from Sydney to Melbourne.

Great Railroad Tunnel.

The Wheeling Gazette of the 16th, in speaking of the great tunnel of the Baltimore and Ohio Railroad, says:—We have received from the contractors full reports of the result of operations upon the great tunnel on the Baltimore and Ohio Railroad, and we cannot forbear expressing our astonishment at the result. The entire distance driven in by the shafts in the space of about five months is 5,384 feet, and of that 494 was driven from the 5th of November to the 4th of December, inclusive. It is truly extraordinary work. There is no coal within the excavation, but rock, sand, and gravel, the bed being generally dry.

New York and New Haven Railroad.

The splendid depot of this road is now about completed; it is situated on the corner of Canal and Centre streets. It is an ornament to our city and a credit to the managers of this Railroad. The receipts on this road contrast very favorably with the expenses; the stock is good, and must always be growing, especially under such able management as that of the Superintendant, Robert Schuyler.

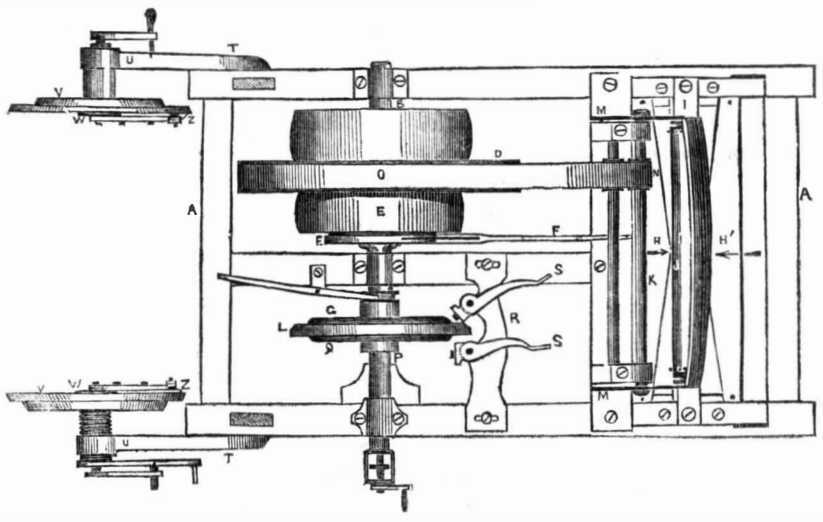
Stephenson in Egypt.

Mr. Robert Stephenson, the celebrated engineer, has gone up the Nile to inspect the barrage of that river, which has been carried on for many years, and take a survey of the Suez desert, with regard to the practicability of a railroad between Cairo and Suez. Any suggestion from Mr. Stephenson would be very valuable in this country.

A locomotive engine has been lately manufactured at the works of the great Northern Company, at Boston, England, which is warranted to run the distance from Boston to London, (108 miles) with six carriages and two breaks, as a usual express train, in one hour and a half.

The Ohio steamship, on her last passage from New Orleans to New York, smashed her engine and came near being lost.

HUTCHINSON'S MACHINERY FOR MANUFACTURING BARRELS.---Figure 1.

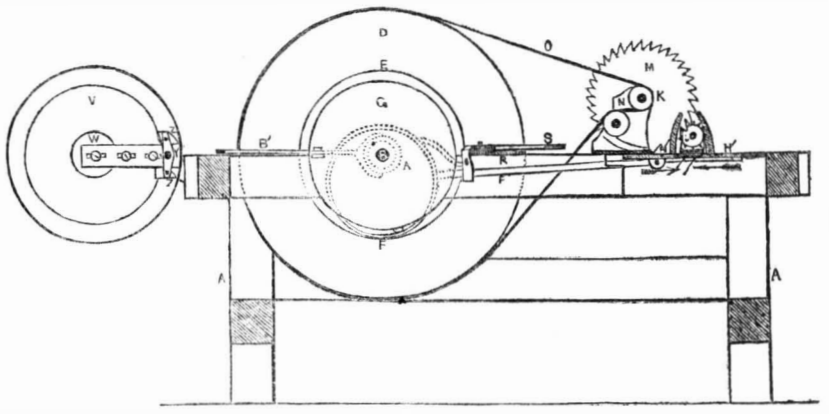


This improvement is the invention of Mr. C. B. Hutchinson, of Waterloo, N. Y., a very ingenious inventor, and who has secured a number of patents already. His stave splitting machinery, which was published on page 9, Vol. 5, Sci. Am., is justly held to be the best for that purpose in the United States. The present engraving represents modes of jointing the staves, and cutting them to their proper length when jointing; also a most beautiful method of cutting the taper or bevel or barrel heads &c., also a most excellent method of cutting the croze (groove) and chamfer on the ends of barrels, inside, for the reception of the heads and bottoms; and re let us state, before proceeding further, that Mr. Hutchinson, by his improvements, is able to produce ordinary flour barrels for 18 cents each, where timber is plenty—a reduction in price of 25 per cent., at least.

Figure 1, of the accompaning figures, is a plan view (looking down on the top of the machine.) Figure 2 is a side elevation, partly in section. Figure 3 is a perspective view of the cutters, cutter blook, and shaft, for cutting the croze and chamfer. The same letters refer to like parts.

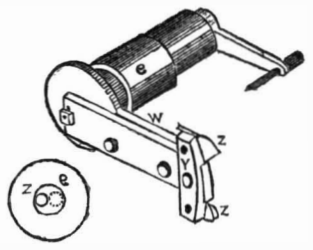
The first part of the invention relates to jointing the staves. A is a strong frame, made in the usual way; in front of it there are

Figure 2.



two knives, H H, fig. 1; they are constructed to form the edge or joint the stave with a sloping cut. They move out and in horizontally, on a plane with the top of the frame: one knife joints one edge of the stave, when moving out, the other joints the opposite edge when moving in the opposite direction. The arrows show the direction of the knives. The knives are moved by an arm, F, which is attached by crank or eccentric to the main driving shaft, B; D is a pulley for driving two circular saws, M M. Above the jointing

Fig. 3.



knives is a roller, J, which swings in bearing boxes on each side. This roller has points on it, against which the stave is pressed to retain the said stave; then one knife, moving out, joints one edge of the stave; the roller is then swung over, and the other knife joints the other edge: while this is being done, the circular saws, M M, cut off the ends of the stave to the proper length; O is a band from the large pulley to drive the saw shaft, K, and pulley, N. This a most simple method of jointing the stave and trimming its ends.

The barrel heads are bevelled by being placed between two clamp discs, and made to revolve while two knives cut the bevel; G Q, are the two discs on the main shaft; L is the barrel head; S S are the two bevelling knives secured on pivot axes on a plate, R, so as to set them out to cut different bevels. A common clutch, B 1, throwthese discs out and in gear when required. The action of these knives is shown in figure 1; either one or a double bevel may be cut.

The crozing arrangement is for the barrel after it is put together, and the truss hoops on. There are two discs, V V, fixed upon stationary axles, but the discs can revolve. The barrel is placed with its ends inside of these discs; U U are the bearings of the axes, and T T are the bearing supports. One axis has a screw cut on it, so as to run the disc, V, out and in, to fasten the barrel, and to accommodate the space between for barrels of various lengths. On the inside of the axes are fixed the crozing and chamfer knives. They are the same on both sides. In fig. 3 *e* is the shaft on which the discs and crozing arms are secured; W is the arm; Y is a knife box, to secure the crozing and the chamfering knives. The upper knife Z, fig. 3, is a bevelled chamfering knife. The lower Z are two small knives, the one placed a little before the other, and placed so as to cut a cone groove. These cutters can be set by a small handle outside, to croze and chamfer barrels of different diameters. The depth of the croze can also be guaged from the outside. These are important improvements. The barrel is made to revolve by a band passing over it from the pulley E, on the main shaft. We know of no barrel machinery which is so beautiful as this for jointing, turning the heads, crozing and chamfering, and along with Mr. Hutchinson's Stave Splitting Machine, forms a perfect and complete set of barrel manufacturing machinery.

More information may be obtained by letters addressed to Mr. Hutchinson, who has taken measures to secure a patent.

Ether.

When mixtures of alcohol and the stronger acids are subjected to distillation, a liquid is formed, to which the term ether is applied, (or by the Germans, naphtha;) and the nature and composition of which differs according to the acid employed; in some cases containing the acid or its elements, and in others not containing them.

To prepare sulphuric ether, equal weights of suphuric acid and alcohol are exposed to heat in a plain glass retort, pouring in the alcohol first and then the acid by a long glass funnel, and adjusting the retort in a sand-bath, already heated to a temperature of 200°. The acid and the alcohol should be well mixed by shaking them together in the retort, when the temperature rises considerably. The receiver should be tubulated to convey away the atmospheric air and any other gaseous products that may be formed towards the close of the operation.

Prepared in this manner it is not in a state of absolute purity, being combined with a small quantity of water. When required free from this, it must be mingled intimately with chloride of calcium, which retains the water; and then be re-distilled.

In preparing ether on the small scale, an ounce or two of alcohol, with as much sulphuric acid by weight, will be sufficient to show the process, condensing the product in a common flask.

Sulphuric ether is not capable of dissolving so many substances as alcohol; still, however, it is always found useful in separating or extracting principles that are insoluble in alcohol or water, more especially in vegetable chemistry. It combines with ammonia, camphor, resins, volatile oils, sulphur, phosphorus, and chloride of gold, but has little or no action on the fixed alkalis, earths, common metallic oxides, and the greater number of the salts.

What is beautiful? A good man struggling with misfortune, and preserving untainted his reputation. A dutiful child obeying the mandates of parents, and walking in the way of righteousness.

Since our last number was issued, another steamboat burst her boiler at New Orleans, and a number lost their lives. Oh, when will there be an end put to such scenes.

The Baltic put into Provincetown, Mass., on last Sunday short of coal. Her passage was a very stormy one.

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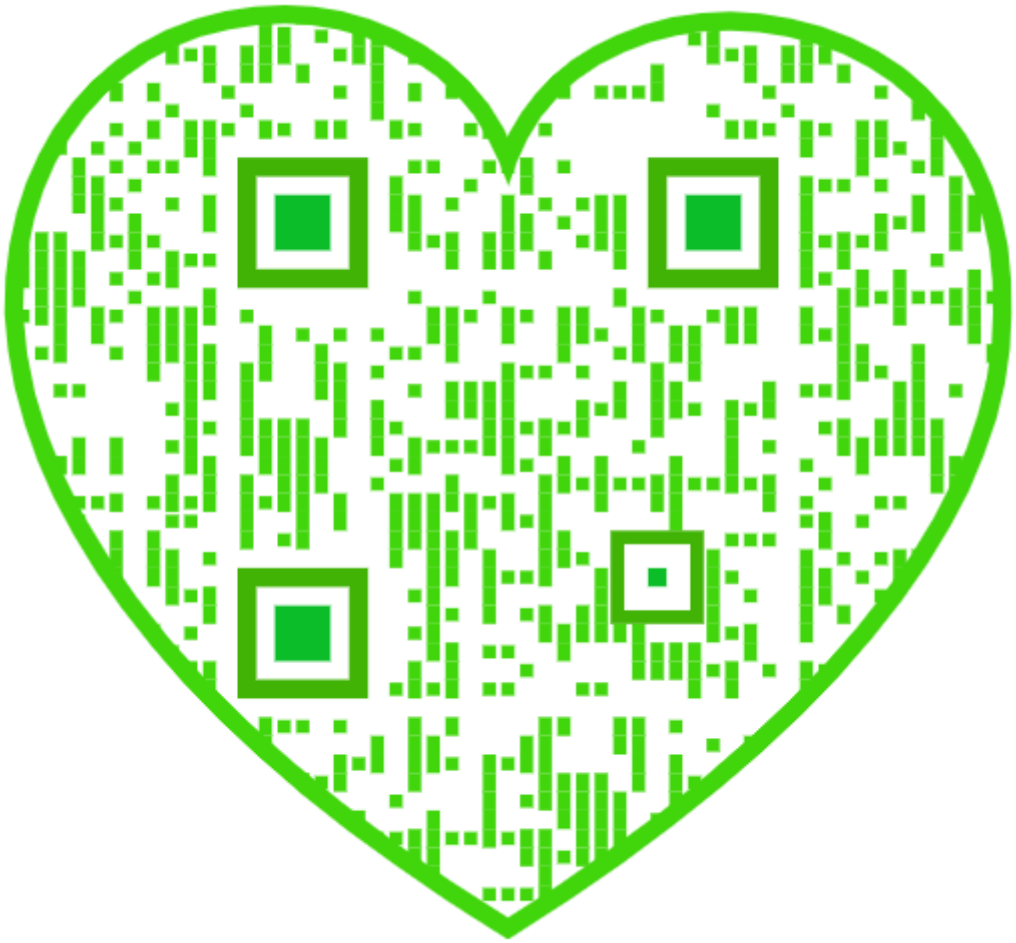

Miscellaneous.

Cotton and Cotton Culture in China.

The following is condensed from the North China Herald of the 31st of last August and will be interesting to our southern readers.

According to the history of the southern (or six) dynasties of China (A. D. 600) the Kaouch'hang reign produced a plant, the fruit of which was like the cocoon of a silk-worm, containing a fibrous material like fine flax, called pih-tee-tsze, the white conglomerated ball. The people of this place used to weave this into cloth, which was very soft, white, and met with ready sale in the market.

It is cultivated on the south of the Yang-tsze-keang, and north of the river Hwae. They sow the seeds in the fourth month (May); the stem of the plant is very weak, and it grows to the height of four or five feet; the leaves are divided generally into three lobes. On the approach of autum, the plant puts forth a flower, which is of a yellow color, like the chrysanthemum, but smaller; some are of a red or purple color. The fruit is about the size of a small peach, including a white fibrous material, in the midst of which are a number of seeds, about the size of berries. One species of the fibrous materials is of a nankeen color. The crop is gathered in the eighth moon (September), and it is denominated cotton. This is the herbaceous cotton. It came originally from Kwang-se, and towards the close of the Sing dynasty (A. D. 1200), was introduced into Keang-nan. Fei-yuen, in his account of Kwang-tung, says, that foreigners do not cultivate silk but employ cotton for weaving. Fan-min-ching, says that the Din-yih and other countries produce the cotton cloth made of a fibrous material from trees. Fang-cho also says, that the barbarians of the southern ocean weave this fibrous substance into cloth, upon which are depicted very small characters and flowers, executed with great skill, called cotton cloth, which is the same with what the ancients denominated white ball cloth.

Choo-hwa, in his account of the cotton culture, says that the cotton plant was introduced into Shanghae from the islands, and was first planted at Woo-ne-king about ten miles to the westward of the city; but now the whole district is covered with it. There are two kinds—the white and the yellew. That which is cultivated near the sea shore, and brought into the city for sale, is called sand cotton; and that which is grown nearer the city is called earth cotton. The natives, however, call it hwo cotton, and do not prefix the term meen, as is usual in other places. The Che-Keang cotton from Yu-yaou district, is less profitable, yielding only seven pounds in twenty, when divested of the seeds; the cotton of Soo-chow may generally be reckoned at the same rate; there are a few kinds, however, a little different; one called the yellow stalk variety, which yields proportionably more of the fibrous material; one is called the green seed variety, the seeds of which are smaller, and the fibrous material more abundant than other kinds; one is called the black seed variety, the seeds of which are small, and of a jet black color, this also is abundant in fibrous materials; another is called the roomy garment variety, the seeds of which are white, and the stalks light, producing also much of the fibrousi freed from the seed. The yellow stalk variety has a hard, tough fibre, the rest are all of a fine and soft quality, good for spinning or weaving. There is another kind called the nankeen, or yellow cotton, which is light and fine, but the seeds are large, while the fibrous material is less in quantity, yielding only four parts out of twenty, when freed from the seed. The time of planting is before the feast of the tombs (6th April), when the seeds should be mixed with damp ashes, and raked lightly over the ground; cover the whole over with earth, and in the third or fourth moons (April and May) the young shoots will spring up. The root of the cotton is single and straight; the leaves form points and angles. In the middle of summer, the stalks gradually become reddish and black, when small flowers are given out, of the color of chrysanthemum, with a streak of red in the middle of the yellow. When the fruit is produced, each one is divided into three or four compartments. The fruit when unripe is called the cotton bell. When the fruit is not ripened throughout, and it becomes conglomerated, like a mass of damp fibres, it is called an inverted sack. The first crop of cotton is called early cotton, and the last late cotton. When the cotton is injured by frost, and appears coarse, it is called frost-bitten cotton. All cotton fields, previously to the seeds being sown, must be manured, either with compost, or ashes, or bean-cake, or fresh earth, in proportion to the fertility or unproductiveness of the soil. The bean-cake must be broken up, and not be put in large fragments upon the ground. After this, again settle the furrows, and divide them equally. The inhabitants of this district, who plant more extensively, do not use more than sixty cakes to an acre; nor more than ten hundred weight of compost to the above amount of ground, lest the soil should become too rich, and the plants shoot up high, without yielding any fruit; or if they do yield fruit, lest it should produce worms. There is also a method of manuring by means of grasses. In the end of autumn sow your fields with clover, the leaves of which you may cut down in order to enrich the rice land, while the roots may be left in the ground for the benefit of the cotton. Should the grasses not be abundant, you may take barley or beans and turn them over in the ground, when the result will be better than if you had manured with other substances. When the ground sends forth its vapors, cold predominates; when manure is abundantly employed, heat prevails: this is according to the nature of things: but fresh earth is adapted for correcting the cold of the ground, and also for qualifying the heat arising from manure, by which means the fruit will be abundant, and no worms will be engendered. The proverb says, fresh earth is good for cotton; but you must put down your manure upon the fresh earth. The mere addition of new mould has no effect. According to the plan pursued at Yu-yaou, after the bean-cake is spread over the field, then some fresh mould, which will not only corect the heat, but reduce the number of worms.

"In the Shanghae district the husbandmen are very diligent, and plant more cotton than rice. In the autumn and winter, they cultivate wheat and vegetables, the harvest of which they reap in spring of the following year. The poor and aged people then grind the wheat for food, and the wheat of these eastern districts has become famous in other cities. The farmers of this district are in the habit of consulting prognostics in every matter, which are not often verified. In the autumn they dread too much heat, and say in their proverbs, 'when the autumn is bad, the bushel will feel it.' Still, they are fond of thunder; for, as their proverb says, 'Thunder breaks the violence of the autumn, and prevents overflowing tides.' For when the cotton is just in blossom, should the tides rise high, impelled by the winds, and accompanied by rains, the cotton will all become rotten. Hence the proherb above referred to.

The practice of spinning and weaving is not confined to the villages; even in the cities and towns it is pursued. The village dames early in the morning may be seen bringing in their yarn to market, to exchange it for cotton; after which they return, and the next morning bring with them their yarn which they have spun therefrom. This is with them a constant practice. They can weave a piece of cloth in a day, and some are able to finish two. When only two fingers are engaged in holding the threads, the machine they work with is called a hand-wheel, but in this district they work off three thrums with one hand, turning the wheel with the foot, calling it then a foot-wheel. Though the people are laborious and diligent, yet, when they have paid the public taxes, and the interest on their capital, before the year is expired they find their pockets empty: for food and clothing, therefore, their main dependence is on weaving; hence females feel themselves obliged to keep at home, and maintain purity and decency of behavior.

The most celebrated place for embroidery is the Loo-heang-yuen. The mode adopted is to split the threads into very fine filaments, and employ needles like hairs, with which they depict figures and scenes as if they had been drawn with a pencil.

Cotton—The city of Shanghae is celebrated for its cotton. The profit arising from its cultivation exceeds that of wheat and rice, and more attention is given to it in this than in any other districts of Sung-keang prefecture.

A Learned Journeyman Printer.

The "Albany Dutchman" contains a well written memoir of Mr. John Paterson, a journeyman printer, who, by the way, is a genius of no common stamp. It seems that he was born in New Jersey, in 1799, of poor parents, and went to live in Canada in 1803, where he lived till he was a man, and learned, by dint of self-culture, to be both a carpenter and a doctor, and afterwards learned to be a type-setter on the Niagara Spectator. He afterwards came to Buffalo and finished his trade in the office of the "Buffalo Journal." He came to Albany in 1822, and the degree of Master of Arts was conferred upon him by Union College, in 1836. He can read Greek, Latin, Hebrew, Arabic, and can converse with the inhabitants of a great number of European nations. He is a profound mathematician, and has lately produced a great work on that subject, called "Calculus of Operations." "With no aid," says the Dutchman, "but industry, and no higher salary than that which is bestowed on a journeyman printer, Mr. Paterson has become not only thoroughly acquainted with every department of human knowledge, but has acquired a handsome little property, and owns one of the best selected libraries in the city. The latter contains some three thousand volumes, while its estimated worth is put down at $6,000."

Mr. Paterson is now in the employ of our esteemed friend Mr. Joel Munsel. He is a monument of energy, perseverance, and ability.

A Steam Navy.

Com. Skinner, Chief of the Bureau of Construction, &c., in his report to the Secretary of the Navy, suggests the propriety of building a steamer to receive the machinery of the Princeton; and also of fitting the new frigates Sabine and Santee with stern propellers. The United States Government has but one propeller vessel, the Massachusetts, in actual service, and one only, the San Jacinto, in the progress of completion. In consequence of delay experienced in the manufacturing of steam engines at the foundries employed, Com. S. recommends, as a matter of economy of money and time, that the public yards be supplied with the necessary apparatus for the construction of steam engines for naval purposes. It is also proposed to razee the Franklin 74, to arm her with batteries of heavy guns, thus rendering her a formidable vessel of war. The second-class frigate Macedonian it is proposed to razee, and arm her also with a battery of shell-guns, instead of the present armament of 18-pounders.

Steam Communication with China.

The initiatory step in the movememt for a regular steam communication between San Francisco and Canton is about being taken by an enterprising merchant of the former city, who has purchased the well known steam propellor "McKim" and intends running her regularly between San Francisco and the Sandwich Islands. This is the first link in the chain of steam communication which is to connect the points named, and it will require but an additional vessel to ply between the Islands and Canton to make the line complete.

Brown's Tobacco Press.

We have been informed that a silver medal was awarded to Mr. A. D. Brown, of Clinton, Geo., for his Tobacco Press, by the Maryland Institute. This press was illustrated in our last volume, page 412. The medal, as a token of the Institute's approbation of its good qualities, could not have been bestowed more judiciously.

The Construction of Roads.

A few weeks ago a petition was presented to our Common Council against paving any more of our streets with what is termed the "Russ Pavement." The reasons set forth, were, that the blocks in Broadway had become so smooth, there were great danger in the falling of horses, as they could get no proper foothold. This we predicted would actually take place, when the pavement was being laid down. The blocks are too large, and when they are worn smooth, it is like travelling on a field of ice. It is singular how few read about such things—how limited the knowledge is, of those who should know better, upon such subjects. The same kind of pavements are old, and in those cities where they are used, they have to be picked with hammers, every few months, to roughen the surface.

A correspondent, Mr. John Thomson of North Second street, Philadelphia, writing to us on the subject of roads, proposes to construct roads by blocks cast of iron run among common road stones, used for Macadamizing. The moulds, he says, should be packed with stones and the molten metal run among them, forming a solid mixture of iron and stone, which would not be costly, would afford a good foothold for horses with the stone slightly projecting, and the old material could always be run over and used again. We would like to see such a road get a fair trial; it is indeed a plausible plan.

Mr. J. E. Ware, writing to us from St. Louis, states that he has invented a new method of constructing roads of wood, suitable for highways and cities, which would be a great saving to our city, as affording the best and cheapest of street pavements. When the patent is secured we will publish a description of this invention, which we believe is a good one, and destined to affect very important and beneficial results.

In Chicago every one of the streets are planked with oak. This system was adopted after a fair trial of a section of street—there is not a foot of stone paving in that city. Mr. Ware informs us that he visited that city last October, and made inquiries of the Chairman of the Committee on Streets relative to the plank roads, and the answer was "we have tried the plan for seven years, and are satisfied, and can urge its adoption on every city and town, as superior to any other method for making streets." This is excellent testimony and should meet with general attention, for it is stated that the planks last about fifteen years, and the cost per foot is only five cents.

In New Orleans they are beginning to use this road, and so are the cities of Cleveland and Detroit. We should like to see a section of our streets tried with this, but we shall say more about it when we publish Mr. Ware's plan, and then the public will also have a better opportunity of judging of its merits.

Notice.

In our advertising columns will be found the offer of sale of a share in a patented invention, and for the purchaser to act as agent for the sale of patent rights; appended to the advertisement is our certificate "that we consider the invention one of value and merit." The cause assigned for the sale of a small share, is, we are also aware, the true reason, for the invention, having, in consequence of its value, been warmly noticed in the Scientific American, many applications were made to us, which we forwarded to the inventor. These, from want of time, have not been attended to, and an invention of general practical value lies almost dormant. In the hands of a smart man, large sums might be realized.

The Gas Outrage.

Our Common Council has extended a contract for 18 years with our gas companies, to supply our city with gas. There are men who would sell their country for a mess of pottage now, as there were in the days of toryism. Corruption is not confined to the officials of monarchical governments. We hope the Mayor will veto the contract. At the present moment, there is no doubt but, if Mr. Paine would engage to contract for the supply of cheap gas to our citizens, he could soon strike a bargain.

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Mr. Paine's Light.

Mr. E. Wright, Editor of the "Boston Chronotype," who was, for some years, a Professor of Chemistry, visited Worcester two weeks ago, to see with his own eyes the Light of Mr. Paine. He has published in the "Chronotype" the results of this adventure, and the conclusions to which he has been brought by occular demonstration. He acknowledges that when Mr. Paine's discovery was first announced, he expressed distrust of it, which distrust settled down into scepticism after the report of what is termed the "Scientific Committee." He now believes that Mr. Paine is the modern Prometheus, "who has stolen from heaven a more ethereal fire than old Prometheus—a fire which curbs the power of mortals." He thinks that as old Promstheus was persecuted by the savans and working classes of old, it will be nothing wonderful if old experience is repeated. We will now give some extracts from the article alluded to, premising that the opinions expressed are identical with those of the editors of the "Worcester Palladium," "Massachusetts Spy," and "Worcester Tribune:"—

"What we have seen enables us to say, not only that he has extorted from nature the secret of the artificial production of light at a nominal cost, but that he has got hold of the key which unlocks and enables him to command a new force of nature, which is soon to supersede most of the forces now employed—something which is destined to work a revolution both in science and art.

The operation as we saw it, was as clear and clinching a demonstration as we ever witnessed in the range of chemical science. There was a rapid and abundant evolution of gas from the water in the jar, with which nothing whatever communicated save two flat strips of copper and the small tube which terminated in the jet or burner, without any possible connection with any thing between the jar of water and burner, save the spirits of turpentine contained in another smaller glass jar. The electric apparatus being put in motion, as soon as the air over the water had been expelled and the exit was closed, the pressure over the water drove the gas rapidly through the spirits of turpentine, and the jet beyond it being lighted, burned freely and with a high illuminating power. A jet attached to the tube between the jar of water and of spirits of turpentine, was lighted, and we saw the unmistakeable form of hydrogen, scarcely visible by daylight. This pure hydrogen was the gas evolved from the water, and could not possibly have come from the turpentine, for the current was all the while flowing from the water *through* the spirits of turpentine—and how could the spirits of turpentine give an illumitating flame on one side and the invisible flame on the other.

Here, then, whatever may be the agency exerted on the water, by or through the flat ribbons of copper, be it something or nothing,—whether we understand it or do not understand it—water is first converted into hydrogen, or some invisible burning gas, and then, having passed through spirits of turpentine, into a gas of very luminous flame.

So far as the light is concerned, here it is. Mr. Paine produces it, some how, and does it abundantly. There is no rubbing this out, and it is unpardonable in the "scientific men" who must have seen it, that they were unwilling to acknowledge it—that they omitted a portion of the demonstration, and so left the public to infer the power and agency of other causes to account for the effect!

We now come to the question of the cost. Mr. Paine showed us every part of his apparatus, including his pecular *helices* and *electrode*, not shown to the scientific men before mentioned. We are not at liberty to explain to our readers the peculiarity of their construction, suffice to say, they elucidated the subject much to our mind, and clothed the discovery with scientific interest superior to its economical and practical.

The means by which Mr. Paine exerts an agency upon the water through the copper ribbons, is a sort of electro-magnetic condenser, an instrument different from those manufactured by the electro-magnetic instrument-makers in this city, only in the interior construction of its revolving helices. It consists of two sets of larger permanent, horse-shoe magnets, parallel and opening in the same direction, between the poles of which a pair of helices are made to revolve horizontally.—There is no galvanic action in the case, and no expense whatever on these helices but of the slight mechanical force which is necessary to give them a moderately rapid revolution, they meeting no resistance but that of a common pivot and the slight friction of their poles upon metallic discs to effect the successive discharges. But the power of this simple arrangement to evolve electricity is tremendous. The electrical force compared with the mechanical cause, is like that of the rush of water which carries the wheel of a great cotton factory compared with the effort of a child who may hoist the gate. At each discharge of the helices, and there are many in a second, according to the rapidity, an abundant crop of gas bubbles is produced. And this is owing partly to the peculiar construction of the electrode, or form of the poles where presented in proximity to each other in the water of the jar. This electrode is a point of great interest, and it is just at this point that the mighty and mysterious fluid, so potently commanded and propelled by helices, may prove too big for its business and show its relationship to the favorite weapon of Jove. Here is a stupendous dfficulty which has tasked the courage and inventive genius of Mr. Paine—a difficulty of which the public could not be aware, and which seems to account for much delay. He has tamed the thunder-bolt in this delicate point, at least so far as to insure perfect safety with due care. Other safe guards may yet be added. However, it is but right to say, that it would not be strange if carelessness and temerity should hereafter meet with a fate here—that will be a caution to them.

The next question is, whether there is any expense of the spirits of turpentine. We certainly could not discover, while we watched it, the slightest waste or diminution. Mr. Paine, and others testify that there is no expenditure of that material. The nature of the luminous flame convinced us that it had gained nothing in quantity, only something in quality, from the spirits of turpentine. And this hypothesis, as any booked-up chemist will admit, is nothing unprecedented. In Stockhardt's Chemistry, an excellent work, we find the following passage—page 473:

"Starch, as shown by these experiments, is converted by sulphuric acid, on moderate heating, into gum; on stronger heating, into sugar. In the latter case, also, dextrine is first formed, but this soon passes over into sugar.—Accordingly, sulphuric acid exerts two different actions. By the first action, the starch becomes gum (dextrine.) By the second action, the dextrine becomes sugar.

It has not yet been explained how this effect was produced. Starch, starch-gum and starch-sugar have each the same constitution (isomeric,) so that their difference undoubtedly depends upon a different arrangement of the atoms of carbon, hydrogen, and oxygen contained in them, and it is undoubtedly the sulphuric acid which effects this change in the position of the atons."

Then again, after a man has, with his own eyes, seen water converted into hydrogen, and nothing else—unless the oxygen goes off through the solid copper ribbon of the positive pole into a cup of water, and is there drowned without a sign or a bubble—we say, after a man has seen this transformation of water, so unauthorized by the books, it will not be very incredible to him that the spirits of turpentine may change the *quality*—the electrical state—arrangement of particles, or whatever you may suppose it—in the hydrogen, without imparting anything whatever to it. This, we must say, is what we are strongly inclined to believe that it does. On the whole, we feel confident that Mr. Paine has discovered the means of producing an inexpensive light of the purest and most efficient quality, and opened a new and vast field in science. We have seen for ourself, and find that we have done Mr. Paine very great, though not intentional, injustice. And we can hardly find words to express our surprise at the Scientific Report, which was partly the cause of our doing so. The demonstration which Mr. Paine then presented could not have been of a doubtful character to *chemical* eyes. Those gentlemen must have understood and believed more than they reported."

[We publish the above, (although it is longer than we would desire it to be for our columns,) for two reasons; first, it is the opinion of a scientific gentleman and an able editor; second, it deserves consideration. We do not think that justice has been done to the "Scientific Committee." They were invited—Mr. Paine did not shew them his process, for he was not there, and one chemist on that Committee, has not a superior as a clever analyst, in our country. The Report of that Committee was published on page 332, Vol. 5, Scientific American. It is a fact, that a majority of mankind pay a decided homage to the "guinea's stamp," and on that account we like to take no man's word for a probable impossibility, however respectable he may be—we therefore say, that the report of the Scientific Committee should stand upon its own merits, and so should the report of Mr. Wright. The conclusion of the whole matter reported by him, is, first, that Mr. Paine has made a discovery which proves that neither oxygen nor hydrogen are simple substances, and that water is not, as has been supposed, a binary compound of these two gases. Second, that Mr. Paine decomposed, by negative electricity, the whole of the water in a vessel, and the gas evolved was *pure hydrogen*. Third, that this gas was produced rapidly and cheaply by mechanical power generating electricity. 4th, that the hydrogen gas was made to produce good white light by passing it through the spirits of turpentine, which catalized the gas without absorbing or consuming the turpentine.

By this we learn, then, that there are no such things as hydrogen and oxygen—that is, as simple distinct substances. We must have more of the why and the wherefore, before we can believe this. The quotation from Stockhart does not satisfy us altogether; there is a difference between the compounds *starch*, *dextrine*, (British gum) and *sugar*, in quantity if not in quality. Starch is composed of C 12, H 20, O 20; Grape Sugar (the kind made from starch,) is composed of C 12, H 14, O 14, (carbon, hydrogen, oxygen.) It is true, however, that each has the same constitution, and the comparison is clever, but he might have carried it further and stated that the atmosphere and nitric acid had the same constitution. Has the hydrogen, after passing through the turpentince, been analyzed. This is the way to test whether carbon is absorbed by the hydrogen when passing through the turpentine. There is still, no doubt, a vast ocean for exploration before the chemist; but we like chemists who have the spirit of Davy, who never wrapt himself up in mystery, but let the world always know how he was progressing. In last week's Scientific American, Mr. Paine claimed the discovery of the magnetic properties of oxygen; now, had he published his discovery boldly, at the time he stated he had discovered it, there would have been no occasion for disputing his claims as there now will be. In respect to the turpentine not being absorbed by the hydrogen, there is collateral testimony in favor of Mr. Paine, and there is also testimony against him. If water can be all resolved into hydrogen, surely hydrogen can be resolved into water. Now it is well known that it requires hydrogen and oxygen, and a third substance to produce water. Hydrogen and oxygen will remain as distinct gases, in one jar, for any length of time, without forming water, and not until a piece of platinum, or the electric spark, performs the marriage ceremony, will unite chemically to form water. This wants to be cleared up in the case of Mr. Paine's discovery. These things should be treated fairly, and good reasons given. Hitherto water never has been decomposed by a single pole of a battery, and those who believe it cannot be done, are entitled to the greatest confidence, until it is publicly demonstrated to the contrary. The public, as yet, know nothing definitely about the principles claimed to have been discovered by Mr. Paine, and until we can publish something about the why and wherefore, we will occupy but little space, if any, with notices of this light. We have to crave some indulgence for the length of this article, after having said so much upon the subject before; and we promise that, whenever we are convinced that we have been wrong in our opinions, we will acknowledge the same, cheerfully, but not until we can let our readers know the reason for our conversion; and here let us say, that our mind has been always leaning towards some discovery to be made, like that of Mr. Paine's, from the fact that it was a favorite idea with the able teacher who gave us our first chemical lessons, that "water would yet be used for fuel and light everywhere."

Phenomenon of Vision.

MOBILE, 16th Dec. 1850.

MESSRS. EDITORS—It is a known fact, that, by puncturing a card with a fine needle, a person may read print or examine an object within a very short distance of the eye, through the hole so punctured; when, without such assistance, everything would appear confused. Acting upon this principle, a few months since, I fashioned a pair of spectacles to fit the outer form of the eye so as to exclude, in a great measure, light from the retina, and made a small hole in each oval cup-like frame, opposite the pupil, and was agreeably surprised to find that I could read or write by day or candle-light, with a more distinct vision than by natural means, producing, also, a pleasant and agreeable effect. I have not the least doubt but that the difference in the size of the orifice will be all that is necessary to apply them to different ages of sight.

Your notice in No. 12, (Dec. 7, 1850,) of "Some Phenomena of Defective Vision," induces me to make the above statement for the present. ROBT. M. LIVINGSTON.

Mines of Wales.

Some of the mines are truly grand undertakings. The Consolidated mines, the largest of the Cornish group, employ upwards of 3,000 persons. One of its engines pumps water from a direct depth of 1,600 feet, the weight of the pumping apparatus alone being upwards of 500 tons; the pumping-rod is 1,740 feet long, and it raises about 2,000,000 gallons of water in a week, from a depth five times the height of St Paul's. These are, indeed, wonders to marvel at! The Consolidated and United mines, both belonging to one company, are stated to have used the following vast quantities of materials in a year:—Coals, 15,270 tons; candles, 132,144 lbs.; gunpowder, 82,000 lbs.; leather, for straps, &c., 13,493 lbs.; pick and shovel handles, 16,698 dozen. Sir Charles Lemon has estimated that in the whole of the Cornish mines £13,000 worth of gunpowder is used annually; that the timber employed in the upper-ground works equals to the growth of 140 square miles of Norwegian forest; and that 37,000,000 tons of water are raised annually from the mines.

Corrosive E ects of Cochituate Water upon Lead Pipes.

Mr. Wm. A. Hayes, of Boston, Assayer to the State, in a communication to the Boston Traveller, bears testimony to the corrosive action of the Cochituate Water upon lead pipes. He says:

"The testings have been continued at intervals by experienced chemists, since the introduction of the water, and by myself during the past eighteen months almost weekly, and in no case has lead ceased to be discovered in the water. The interior surfaces of the lead pipes, show the effects of corrosion, which takes place with such water, in accordance with a natural law, as certain in its operation as those we recognize in planetary motions. For years before this water was introduced, its corroding power on lead was observed and registered, and the influence on the water, of the materials used in constructing the larger conduits, has been the subject of study since that time. For more than eighteen hundred years, the belief of the intelligent, that such water corrodes lead, has been entertained, and it is striking confimation of its accuracy, that no recorded observation of modern times, conflicts with this conclusion.

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New Inventions.

Wilson's Sewing Machine

In number ten of our last volume we illustrated and described the sewing machine of Mr. A. B. Wilson; since that time a patent has been granted for it, and it is now in successful operation on the next floor above our office.

The Scientific American has illustrated and described more sewing machines than any other periodical, but of all the machines which have appeared in our columns, none can equal this one in simplicity and compactness. It is justly allowed to be the best one ever invented. Imagine a small machine which can be carried in a man's hat, or even in a decent sized overcoat pocket, sewing with more dexterity and accuracy than the most experienced needlewoman, and then you can form some idea of its merits. It can sew curved or straight seams, and its stitch does not rip out. It can be set to sew long or short stitches just by a turn with a screw-driver, and taking all things into consideration, we believe that it is one of the most important inventions of the age. We will yet live to see it forming part of every household furniture, for it is undoubtedly a family labor-saving machine. Every family which has much sewing, should have one, for it is not expensive. E. E. Lee & Co., No. 128 Fulton street, are the assignees of the patentee, and by them it is now offered to the public, for the sale of rights, &c.

New Mashing Apparatus.

Mr. Joseph Wright, of Waterloo, N. Y., has invented and taken measures to secure a patent for a valuable improvement in mashing apparatus, which consists of a number of parts; one is to feed in the meal, &c., for mashing, along with hot water, in just such quantities as can be mixed up in the inside of a small cylinder with revolving beaters inside, according to the speed of the revolving beaters, so as to mix the meal, &c., most thoroughly at a low heat. To do this the hopper has a revolving bottom, with receiving and cut-off cups, which work in unison with the revolving beaters, so that the feed is always in proportion to the mixing action. There is a complete mixture of the meal, &c. The mixing cylinder is small, and it delivers the mixed substances into a large cooler with revolving agitators, to cool as rapidly as possible. The apparatus has been pronounced a most excellent improvement.

New Splice Coupling for Railroad Check Rope.

Mr. Lawton J. Ware, of Warren, R. I., has invented a very neat improvement in the coupling of check ropes for railroad cars. At present the ropes pass over the cars, but by this plan they can run through the inside near the ceiling, and a check rope is provided complete for each car, and capable of being coupled to the check rope of the next car, or uncoupled in a moment. The coupling is neat, durable, not easily deranged, and is as smooth and round as any part of the rope.

Catalyzing Hydrogen gas.

We have received a communication from a distinguished scientific gentleman, confirming Mr. Mathiot's experiments and corroborating Mr. Paine's discovery of turpentine catalyzing hydrogen. We will publish it next week. The Chronotype has published another able article on this subject. We will notice it next week.

Bills for Reforming the Patent Laws.

It is our intention next week to review the two Bills now before the Congress, for reforming the Patent Laws. One is in the shape of an amendment to the other Bill, introduced by Senator Davis. We heard that it was concocted in the Patent Office. It never can pass. It wants to make the Patent Office more of a Star Chamber than it now is, and every body knows it is too bad already.

Improvements in Electro Magnets.

John Gavit Esq., of Albany, N. Y., has made some improvements in Electro Magnets for telegraphs, which will create no small degree of astonishment by-and-bye. The improvement relates to the construction of the magnet, involving a radical principle.

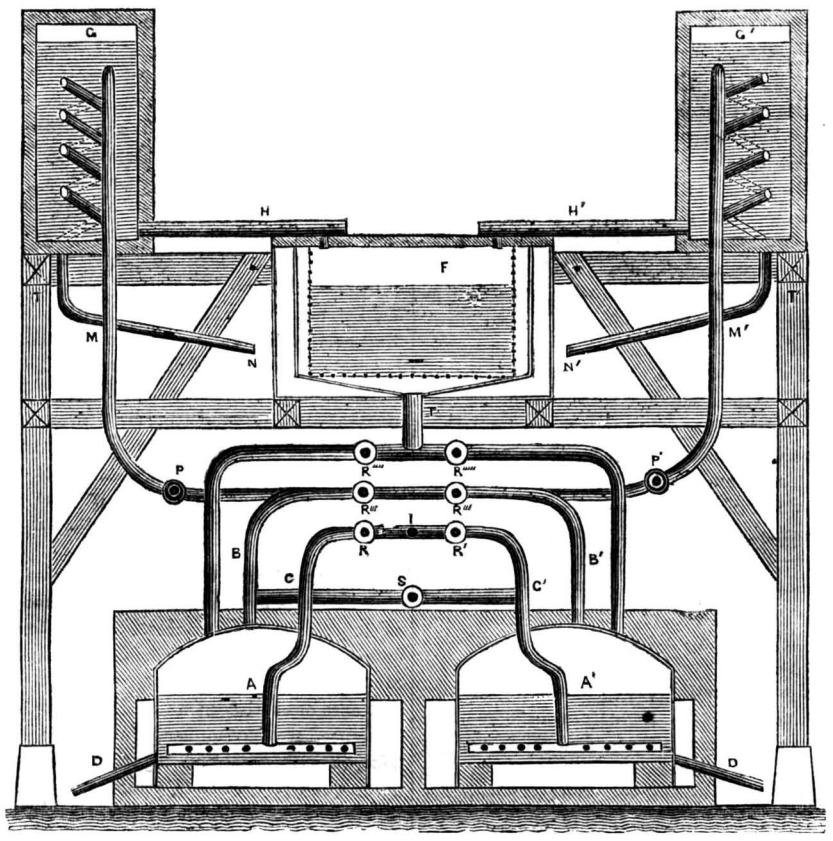
THE EXTRACTION OF ESSENCE OF TURPENTINE BY STEAM.

The accompanying specification is translated for the Scientific American, from "Le Conservatoire," and will be found to possess considerable interest to many of our readers.

M. Violette, a French gentleman, who has, with so much success, employed steam in producing certain useful results, at which it would have been thought almost impossiblo to arrive by such means, has lately been occupied in applying it to the manufacture of essence or spirits of turpentine; and the application has been attended by the most successful results.

The process is about to be immediately applied in the relinquished manufactory of the company of Arcachon; and we shall show, that not only is the product superior to that obtained by the old process, but that the cost of production is less.

By the old process, the raw resinous material is placed in an alembic or still body, surmounted by a head or capital, from which a pipe leads to a condenser, a quantity of water being also introduced therein; when one charge is exhausted the capital is removed, and the alembic refilled, during which, when the resin comes in contact with the highly heated bottom of the alembic, a considerable portion of vapor is given out, which escapes before the capital can be replaced, causing a considerable loss, inasmuch as, by that and other causes, only about from 15 to 18 per cent.



in weight of essence, as spirit, is obtained from the raw material.

It is known that resinous matter will not boil unless submitted to a very high temperature, and that boiling water, in contact with a liquid at a higher temperature than the boiling point, inflates or blows it up into a frothy state, which is the case in the mixture with the resinous matter above described; this renders the refuse resin, after the turpentine is extracted, opaque, and it requires to be clarified for use.

The great advantages in the process of M. Violette, are, that it does not require a heat greater than that of steam, at about the temperature of the boiling point of water, and the resin does not require to be mixed with water, steam passed through it, extracting more of its essence, and the quality of the essence or spirit being of the purest description ever produced. The quantity of essence or spirit, extracted by the new process, is from 20 to 22 per cent. of the weight of the raw material, being an increase of over 4 per cent., over the quantity obtained by the old process.

The engraving represents a vertical section of the apparatus. I is a tube for introducing steam, which, according as the cock R or R′ is open, directs it into the alembic, A, or A′—both of which contain the resin. The lower extremities of the steam pipes terminate in pipes or coils, pierced with a great number of small holes, which admit the steam to the resin.

We will suppose that the cock, R, is open, and the steam entering A, passing through the resin it carries off its essence, and escapes through the tube, C R″, and if the cock, R″, is open, R‴ being shut, it will ascend by the tube R″ P M, through which it will introduce itself to the coil and pass from it by the tube, N, into a convenient cooler.

The other tube, B, of the alembic is for the introduction of the resin, which is first placed in its natural state and without being melted, into the metal receiver, G, which is covered with wood, outside, to avoid loss of heat; it is the steam, charged with essence, which, passing through the coil in the receiver, melts the resin, which, by means of a cock (not shown) placed in the tube, H, is allowed to run by the said tube, when it is melted, into another receiver, F, which is the filter. This filter is composed of a metal vessel, closed by a lid and furnished with a double bottom, in which steam circulates, and the filtration is effected without loss of heat or essence, through a wire gauze screen, which surrounds the inside and covers the bottom of the vessel. When the filtered product is to be conducted to the alembic, A, the cock, R⁗, must be opened, which allows its introduction through the tube, B, exclusively devoted to this purpose. D is the discharging tube, through which the yellow resin, runs out after the operation is finished. It will be seen that the three vessels, A G F, considered independent of the others, with their appendages, form one complete apparatus, and the vessels, A′ G′ F, another, each bearing the same relation to the other; the same arrangement may be also repeated at the back of those shown in the drawing; in order that the manufacture should be as economical as possible, it is necessary that the steam should charge itself with as much of the essence as it can possibly carry off, and the way of arriving at that result, is to increase the contacts. Thus M. Violette always passes the same steam successively through three alembics, and it is after leaving the last that it passes to the resin beater, G, before delivering itself into the sole cooler, which could not be conveniently represented in the drawing; to this cooler all the pipes, N N′, lead. During the time that the three alembics are in operation, as described, the fourth is at rest; it is emptied and refilled, but it will be understood that, in order that the work be regular and constant, the steam must commence to enter each of the four alembics successively. If, then, in the first operation, it goes from A to A′, and from A′ to A″, in the second it travels through A′ A″ A‴; during the time A′ is emptied of the resin, from which the essence has been extracted, and refilled with new resin, the steam commences its work in A″, and circulates through A‴, and A, which has just been refilled; the contents of A′ will be exhausted of essence during the second operation above described, and be refilled during the third; in the fourth it will receive the steam which has passed through A‴ and A. With such an arrangement as described, the work will be regular and uninterrupted, which is a great desideratum, and by so long a circulation, the material is insured against being thrown away until completely exhausted of essence.

The alembics are surrounded by masonry, to prevent loss of heat, and to economize still more the heat of the steam boiler or generator, the flues from its furnace may be made to circulate round the alembics. Should it not be convenient to run the flues in this direction, it will even then be an advantage to have an air space around the alembics, as the best means of preventing the escape of heat is to interpose a stratum of air between two solid casings.

The different cocks represented in the engraving are all necessary to control the circulation of the steam and the material; whilst the cock, R″ is open at the same time as P, the impregnated steam is permitted to flow directly through the resin beater, G; if, on the contrary, we shut the cock R″, and open that of S, in the pipe which communicates between the two pipes, C R and A′ R′, and which is represented by the line C S; the steam which, after having percolated through the first alembic, A, ascends C, and passes through S, descending into and percolating through the alembic, A′, from whence it will pass either through the resin heater, G′, by the tube, P′ M′, or by the tube, C′ to the next alembic, A″, at the back, according as the cocks may be open or shut.

Each charge placed in the alembics is 700 kilogrammes (about 1,540 pounds); and the complete distillation is effected in each alembic in six hours, during which time it is successively the first, second, and third of the series, and in this continuous rotation the manufacture proceeds, consuming 8,400 kilogrammes (about 18,580 pounds) of resin, and producing more than 1,800 kilogrammes (3,960 pounds) of essence of the purest kind.

"Compare," says The Conservatoire, "this powerful apparatus, which, with all its framing indicated by T T in the engraving, is only of the height of 3·50 metres, about 11 ft. 4 in., width 3·50 metres, or 11 feet 4 inches, and length 6 metres, or 19 ft. 6 in., with an apparatus capable of distilling a similar quantity by the ordinary means; remark that a steam boiler of four horse power is sufficient for the work, that all causes of conflagration are removed, that the product is better, that the manual labor is reduced to merely turning a certain number of cocks every two hours, and you will see, with us, all the activity which the employment of this apparatus is likely to give to this manufacture of essence, which appears up to this time not to have kept pace with general progress."

"Alembic" is a vessel, and the ones referred to as A″ and A‴ are at the back, not seen. The reader will please bear this in mind.

A Valuable Invention in Case of Fire.

Mr. William K. Phipps, of Farmingham, Mass., has discovered a method of applying a machine to the hydrant in such a manner that he makes use of the pressure of the water to a much greater distance than with the common fire-engine.

We hope where there are hydrants it will be made use of. As the case is now, the greater part of the water, not having sufficient head, falls short of the fire, and does no kind of good, but merely serves to deluge the goods in deposit.—[N. Y. Globe.

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Scientific American

NEW YORK, JANUARY 4, 1851.

The Year that is Past.

The year eighteen hundred and fifty is with the eternity of the past; its moments never can return; but events which have transpired during the successive periods comprised within its circle, will never cease to exert an influence upon mankind. No man lives merely for his own day or his own self; his acts affect others, and every man, even while sleeping in his grave, either sins or saves.

In the field of Physical Discovery, the inventions of Watt, Whitney, Fulton, and Stephenson—those mighty dead, now gathered to their fathers—exert an influence upon the present generation of far mightier import than ever was dreamed of by the most sanguine enthusiast.

Presuming, without any intention of boasting, to speak for the Scientific American as the only true repertory of American Inventions, let us briefly glance at some of the inventions and discoveries which have appeared in our columns during the past year. As only part of this volume is embraced, we must make some reference to our last.

In the first number of the Scientific American, issued in the month of January, 1850, we illustrated and described the important invention of Mr. David Smith, of this city, for the manufacture of shot, whereby the old high towers are dispensed with, and the manufacture can now be conducted in any common building. In February we illustrated the invention of Dr. Potts for sinking piles by pneumatic pressure; and, in the same month, there was described and illustrated the alleged discovery of Mr. Frost, of Brooklyn, relative to new properties of steam. This subject has caused no small excitement among scientific men. Prof. Renwick published the Report of the American Institute on the subject; and Mr. Frost has since reviewed it, with some scorching criticisms. In March we published Mr. Ransom Cook's new Hydrostatic Blowing Machine; also that most simple of all breech-loading rifle's, Sharp's, of Philadelphia. We also published the simple eccentric press of Mr. Brown, of Georgia, which has, since that time, won so many prizes. Machinery for rolling irregular forms of metal, described on page 209, and Kase's pump, on 212, are inventions creditable to American genius: Dick's Anti-Friction Press, Snead's Grain Drier, Wilson's famous Stone Cutting Machine, Schile's Anti-Friction Curve, &c., but here we must stop particularizing, for we could go on at this rate and occupy a whole number, merely by reciting the names of important inventions and improvements which have been illustrated and described in our columns, and first given therein to the world.

There is not a single department of science and art, we believe, but has been illuminated in some way in our columns, last year—planing machines, sewing apparatus, sugar apparatus, steam engines, bridges, steering machines, electro magnetic machines, turning machines,—in good truth, in the department of machinery, our columns bear testimony of the fertility of American genius, and the steady progress of improvement in the physical sciences.

In our present volume, the articles of Mr. George Mathiot on Electrotyping, are the fruits of fifteen years experience, and. as being strictly practical, our country should be grateful to him for the magnanimity which he hasdisplayed, in giving freely to the public that information which has cost him so much labor and study.

When we commenced to write this article, we thought our task would be easy, so far as it related to prominent improvements, but we confess that when we took a steady retrospective glance, we were surprised—and greatly surprised, to find that so many important improvements have been illustrated in our columns. Let any of our readers take up any one of their back volumes, especially our last, and a file of the present, and we are very much mistaken, if he does not feel both pleased and surprised with his examination. As we make great exertions to illustrate two or more new improvements or inventions every week, the accumulation of a years' labor forms a respectable epitome of American inventions; indeed one of our volumes contains ten times more new matter relating to inventions, than any other periodical ever published in our country. While there is a free press there can be no retrograde movement in relation to the sciences—their course must be onward, for darkness cannot exist where the light of the free press shineth. We believe that improvements in the physical sciences have been of the greatest benefit to mankind, and they are yet destined to do far more for the general good than they have done. We will labor, as heretofore, zealously, for the dissemination of useful knowledge, trusting that our friends will still uphold our hands; and, should we be spared by Providence to write the valedictory of 1851, that we will be able to allude to inventions and discoveries described in our columns, which will go down to posterity bearing the impress of manly application and cultivated genius.

Reform of the Patent Laws.

Last week we published an abstract of the debate in the Senate on the Bill to amend the Patent Laws. In all likelihood, the Bill will pass this Session. The writ of Scire Facias, mentioned last week, as being objected to by Mr. Seward, is a writ of application to annul a patent because the patentee has invented nothing *new* and *useful*. The writ is incorporated in the English Patent Laws. It is certainly necessary that, if a patent is granted for something neither new nor useful, there should be some way of repealing the grant of the Patent. At present our Courts can declare either the patent, or a part of it, void, but there is no good specified provision in our patent code for repealing an invalid patent. By the argument set forth, by Senator Seward, the inference drawn is, that when a patentee sues a person for infringing his patent, the defendant can have his writ of *scire facias*, and this will double the number of suits to the great injury of patentees. But we apprehend this will not be the result, for the person petitioning for such a writ has to give a bond to secure the defendant's (patentee's) costs in the event of the writ failing. In looking over the history of patent cases, we find very few such writs have been issued. A very important case upon a writ of *scire facias*, has recently been tried before Lord Chief Justice Jervis, Justices Maule, Williams, and Talfourd, of the English Court of Common Pleas. The case was a writ of *scire facias* to repeal a patent obtained by one Mill, for improvement in instruments for writing, and in the construction of inkstands. At a trial before Lord Chief Justice Wilde, it appeared that the invention consisted of eleven parts, or claims, four of which were contested as not being new—they were old, and the defendant applied for and got a writ of *scire facias*, while the patentee entered disclaimers, for the four claims contested. On the trial of *scire facias*, the Court held that the disclaimers were part of the original patent, and made this rule absolute, so that the writ of *scire facias* fell to the ground. According to *our* present patent laws, if there is one claim good on the patent, if all the rest (be they few or many) are worthless if they are disclaimed, the disclaimer is considered part of the "original specification," but such a disclaimer does not affect any action pending at the time of its being filed.

Another objection to the Bill urged by Mr. Seward was, "if the Circuit Court of one district was to decide for or against the validity of a patent, that judgment would not be conclusive nor final in other districts, as between other parties on the same patent right." Well, then, reform your District Courts. The courts of law are the terror of inventors and poor patentees. Reform that system and do not frighten people into the making of inefficient laws, because there is such a huge machine, with great iron teeth, to chew the bodies and souls of inventors, as our U. S. Circuit and District Courts, as they are managed at present. The great difficulty with our patentees is the mode of procedure in every District. Every new trial is merely an old battle repeated. But our country is peculiar; its great extent, diversity of interests, and, above all, the independence of every State, demands that the citizens of the separate States should have fair trials in patent cases. Why? Because each State, at one period, had the power within itself to grant and annul patents, and this was voluntarily surrendered to the Federal Government, but the rights of the citizen in property were not. Owing to the great extent of our country, there may be machines in public use for years, not patented, which may be unknown to the Patent Office, or others in a different part of the country. It would not be right, then, that a person in a distant part, should have a Government Warrant to property that belongs to another, and this is what a patent gives, unless opposed and rendered void by some means.

We do not like Mr. Turney's last amendment, making certified copies of foreign patents receivable in patent trials. In some cases this would be right, but in very few. Suppose that a patent was granted in Denmark, this year, for a good improvement, but which was never known out of Denmark, for five years; and, after that time, some of our unlettered mechanics should invent and secure a patent for the same thing; and suppose that five years after that, again, some learned Dane should come over here and begin to use this machine, and then our home linguist patentee should sue for infringement, what would be the result? Why, his patent would have its "head cut off" by Mr. Turney's amendment. Would this be justice? Our American was the real inventor and introducer of the improvement, for he knew nothing of the Danish language, and nothing of the Dane's patent. All laws should be made to secure the ends of justice. Instead of making such an amendment to our Patent Laws, we would let such a question be decided by Common Law, by evidence to prove that the patentee, by some means, derived the idea of his improvement from a foreign source. This should be a question of fact, and, if it cannot be proven, let not a foreign patent be of any value as evidence.

We hope that Mr. Turney will consider this matter in all its bearings, so as to encourage our inventors, protect their just rights, and at the same time uphold the general rights of all our citizens.

Incrustation of Boilers.

A letter is published in the London Athenæum, from Dr. J. Davy, upon the all-important subject of Incrustations on Steam Boilers. He procured specimens of incrustations from vessels which had made voyages on almost every sea, such as the Mediterranean, &c., and also from steamships running across the Atlantic. He received a specimen from the Europa, after her passage from Boston to Liverpool on the 15th of last November. The incrustation on her boiler, after the said voyage, was about 1-15th of an inch in thickness, and it was stated that an incrustation of the same thickness was formed on her outward voyage. This incrustation was formed although the boilers were blown off every three hours, and the brine pumps kept in constant employ. This shows the rapidity with which incrustations gather on the boilers of vessels crossing the Atlantic. The incrustations collected by Dr. Davy were principally composed of sulphate of lime of a crystaline structure; the other substances did not amount to more than five per cent. of the whole. In narrow seas, contiguous to shores formed by volcanic eruption, it has been found that the waters contained more of the sulphate of lime, consequently, vessels running in such waters were more subject to have their boilers incrust more rapidly than those running in deep oceans.

Dr. Davy does not seem to hold out any means as an effectual remedy for incrustations, excepting the using of condensers and the employment of rain water for the boiler; but he asserts that a great remedy (though not a complete preventative) depends on the saving of the steam, and returning it to the boiler, as far as it possibly can be done, and the using of good fresh water to fill up the boilers for every voyage. Saw dust, grease, potatoes, and salamoniac have been employed to prevent incrustations to very little purpose, as set forth by Dr. Davy, but so far as the constant use of scale preventatives have been tested, and tested fairly to prove their good or useless qualities, we are very much in the *dark*. We have tried to search up facts, respecting the employment of saw-dust, muriate of ammonia, indian meal, and potatoes, in boilers, to prevent incrustations, and we must say that our information is very meagre—nothing that we can present as bona fide testimony, conclusive in respect to any of these substances being perfect scale preventatives. This is a very important question; when we consider that a crust of a non-conducting substance 1-15th of an inch thick, and such a good non-conductor as the sulphate of lime, is formed on every boiler of our ocean steamers, each voyage, we may conclude that the heat of 60 tons of coal is lost, thereby, besides injury to the boiler. Fifty-two voyages, in one year, will be made by a loss of 3,120 tons of coal to make amends for the incrustation of a non-conducting substance, formed in the interior of the boilers. There may not be such a loss, and yet there may be more than this—we have no correct data to guide. The only persons capable of providing such data, are the engineers of our ocean steamers. Would it not be well for them to adopt a system of complete registration respecting the performance of their engines, boilers, &c., the same as is done in Wales, at the mines. This is the only way to to "push along improving."

Preparation of Flax Cotton.

Knowing some of the difficulties of cleaning flax, we suspected that the accounts which had been promulgated in the British papers, respecting Chevalier Clausin's discovery, were somewhat over-colored. We expressed such an opinion two weeks ago, in an article upon American Cotton. Since that time we have received some foreign papers, one of which, "The Glasgow Saturday Post," claims the invention for a Mr. Elijah Slack (a Yankee name, truly,) of Renfrew, Scotland. This gentleman, it seems, obtained a patent in June, 1849, for the production of the material known as "Flax Cotton," and at that time he produced samples which were spun on cotton machinery. It is stated, also, that Mr. Slack's process is superior to that of Donlon's and Clausen's, inasmuch as his preparation is of such a nature that it beautifies the flax, giving it a fine gloss, like silk, and animalizes it, so that when it is mixed with silk or wool, it can be dyed in the same fabric as good a color as the animal substance. As it is sixteen months since the patent was secured, we may justly infer, that if it is such a grand discovery—"a discovery," as the London papers have stated, "which was to cut into the cotton trade," (some of our own, likewise;) we would have heard more about it before this, more especially when we consider how high the price of cotton has been for the past year. If it was true that flax could be raised, cleaned, and spun, as cheap as cotton, it would supersede it, but we do not believe it can, and will not until we see the thing done—and the goods selling in competition with those made of cotton.

Hawking Revived.

Hawking has been revived in England with great success, as we learn by the "Illustrated London News." The hawk-trainers were from the Highlands of Scotland, a place named Arrochar—the seat of the Macpharlan clan. This sport was a famous one once among Lords and Ladies gay, during the days of chivalry. We hope that none of our nabobs will make such fools of themselves as to attempt to introduce it here, as they have done with tournaments and other poppin-jay absurdities of rich fools.

To Our Patrons.

We return our sincere thanks to our patrons and contributors. We wish you all a "Happy New Year!" May you be as happy as we could wish you. We hope to have your smiles through another year. With Prospero; we can say of you, "thy breath hath filled our sails."

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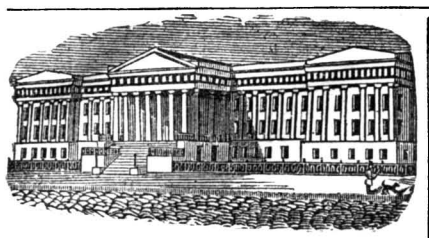

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LIST OF PATENT CLAIMS
Issued from the United States Patent Office.

FOR THE WEEK ENDING DECEMBER 24, 1850.

To Thomas Bragg, of West Milton, Ohio, for improvement in the manufacture of Starch from maize.

I claim the method, substantially as described, of extracting from maize, and other grain or seeds subject to rapid putrescent decomposition, that portion of the starch which is inextricable either by mechanical means or by fermentation of the meal, by the subjection of the unbroken grain to an incipient germination, which is arrested at that stage of the vegetative action at which the starch that exists in an insoluble combination, being liberated, is capacitated for precipitation along with the free starch, by any of the usual processes of maceration and elutriation.

To Geo. Burnham. of Philadelphia, Pa., for improvement in dampening paper for copying presses.

I do not confine myself to the employment of sheet metal as a material for my dampening tablets, as many other impermeable materials are well suited to the purpose, but I claim a dampening tablet, constructed substantially as herein described, of some impermeable material.

To T. H. Burridge, of Jersey City, N. J., for improved means for preventing back-lash in the feed motion of Planing Machines.

I claim the combination in the travelling-table motion of planing machines, of two racks, operated on by two separate pinions, one of which is made adjustable by set screws, with accompanying parts, and so arranged that the pinions may be set as to alternately operate, the one to drive the table forwards, and the other to drive it backwards, for the purposes herein set forth, and operating as shown and described, or in any manner substantially the same.

To Jeremiah Darling. of Cincinnati, Ohio, for improvements in Hydraulic Blowers.

I claim, first, the apparatus, substantially as above described, consisting of a revolving drum, partly filled with water, and provided with chambers, valves, &c., which cause the air to enter at one hollow journal, and escape in a compressed state at the other, for the purpose of producing blast, as set forth.

Second, I claim the manner of separating the water accidentally mixed with the blast, by means of the partitions and cells in the chambers.

Third, I claim the pipe for conducting the water accumulated in the chamber to the hollow journal, and returning it to the drum, substantially as described.

To Lewis C. England, of Williamsburgh, N. Y., for improvement in Vats for Tanning Hides.

I claim the slats, as described, in combination with the vat and the handler, substantially in the manner and for the purposes as herein set forth.

To Chas. W. Hawkes, of Boston, Mass., for improvements in Printing Presses.

I claim, first, the combination of the rocker shaft, and rocker arm, with the fork lever, and the swing platen, subtantially in the manner and for the purpose herein set forth.

Secondly, I claim for feeding cards, the slide and rods, in combination with the swing platen, substantially in the manner and for the purpose herein set forth.

Third, I claim the combination and arrangement of the gauge, the spring, the lever, the trip, the catch, and the wire, with the swing platen, in the manner and for the purpose herein described.

Fourth, I claim the knees, to support the inking rollers, in combination with the spiral springs, the rods, the plate, and the set screws, substantially in the manner and for the purpose set forth.

To John Jones, of Clyde, N. Y., for apparatus for operating window blinds and their slats.

I claim the combination of the shaft, having two levers thereto attached, with the connecting rod attached to the blind or shutter, the whole arranged substantially as herein described, and constituting a blind or shutter opener.

I also claim, in combination, the hollow shaft, having a lever at one end of the same, and two arms at its other extremity, the bolt with its bracket and slot, and the two pins attached to the blind rod, the whole forming an apparatus for working the slats and fastening the blind, when closed, substantially as herein described.

To Wm, D. Mayfield, of Elkton, Ky., for improvement in attachments to Pumps, for agitating the surface of the water in the well,

I claim the application of a series of floating blades to the rod that operates the plungers of pumps for cisterns or wells, for the purpose of agitating the surface of the water, and this I claim, whether the blades and rod are reciprocally prepared, in the manner described, or in any other equivalent way to effect the same purpose.

To Henry Mellish, of Walpole, N. H., for improvement in Instruments for Vaccinating.

I claim the sliding lancet, when in combination with a cylinder, charger, piston, and two springs, in the manner and for the purpose above set forth.

To John C. Parry, of Pittsburgh, Pa., for improved method of loosening metallic cores from hollow castings.

I claim the application of cold water to the core or inner metallic flask of a hollow casting, when the metal begins to cool, so as to loosen the core (by the contraction caused by the action of the water) sufficiently to remove it without injury to the casting.

To James Shaw, of Providence, R. I., for improvement in Portfolios.

I claim the roller back, in combination with the strings stretched thereon, the device, or its equivalent, at the ends, for sewing, and for tightening or loosening the strings and the binders, to secure the sheets in their proper places.

To S. T. Thomas, of Lowell, Mass., & Edward Everett, of Lawrence, Mass., for improvements in Looms for weaving figured fabrics.

We claim the improvement on the jacquard loom, as herein described, to wit, the horizontal harness-shafts or bars, of such length as may be desired, (according to the width of the cloth) upon which the several mail cords or heddles, which constitute the harness or entire mounting, are distributed, at any required distance from each other, together with their hooks, pins, loops or holes, upon or in which the several mail-cords or heddles, which are caused to be raised or operated upon by one needle or distinct movement, are separately fastened or attached.

We also claim the improvement for producing the relation of the pattern prism; the same consisting in combining with the machinery which advances the pattern prism, other mechanism which at the same time shall produce a movement of the draw-pawl in an opposite direction, as descrioed.

To J. N. Walker, of Cincinnati, Ohio, for improvement in Mills for Grinding.

I claim the combination of the hollow spindle, feeding tube, and adjustable screw, with the gimbal, when said gimbal is placed above the openings through which the grain, or other material to be ground, passes to the surfaces of the stones, as herein set forth, for the purpose of having an uninterupted feed through and past the gimbal.

To G. E. Waring, of Stamford, Conn., for improvement in Hot-Air Furnaces.

I claim the annular flue between the cylinder of tubes and the external casing of the furnace for the purpose of distributing the heat, equally over the external casing, substantially as described.

I also claim the distributor or annular distributing chamber, provided with arched passages for the purpose of carrying the heat and products of combustion to the exit chamber, and which also admit of the free circulation of the external air in and around the fire-pot, substantially in the manner and for the purpose described.

To S. R. Wilmot, of Lafayette, Ind., for improvement in machines for weighing grain.

I claim the employment of the gate rod connected to the sliding gate and weighing beam, in combination with the said sliding gate and weighing beam, constructed and operating as aforesaid, for opening and closing the gate, to admit the grain to the dish or scale, or exclude it therefrom at the required periods, by the ascent and descent of the dish or scale, during the operation of weighing and discharging grain, as herein fully set forth.

I also claim the manner of attaching the vibrating weighing scale to the weighing beam, so that the said weighing scale, as soon as the required quantity of grain shall have entered it, shall descend and close the gate and bring the hammer end of the gate rod against the lip of the dish or scale, and cause the scale to turn on its centre, and discharge its load of grain, and immediately ascend and strike the gate rod and re-open the gate, and assume its former position for another weight of grain—every operation of the weighing apparatus being indicated by an index of the ordinary construction affixed to the end of the scales—the said scale being arranged below a hopper of the ordinary construction.

I likewise claim turning the short end of the weighing beam upwards, in the manner represented, and placing the arms to which the bale of the scale are suspended on a line drawn through the fulcrum of the weighing beam, forming an angle of about 50 degrees, with a horizontal line passing through said fulcrum, for the purpose of increasing the leverage of the short arm of the beam simultaneously with diminishing the leverage of the long arm as the scale or weighing dish descends, by which the gate is acted upon with increased speed and force, inclosing the same.

For the Scientific American.

Mechanical Principles.--No. 1.

The very first question to be treated of in the Science of Mechanics, is "quantity."—The other properties of matter, such an "impenetrability, magnitude," quantity, porosity, compressibility, &c., all belong to Mechanics, but, first of all, gravity is the important idea. Without the idea of gravity in bodies, we can have no idea of laboring force, or mechanical power.

Gravity, or weight, seems so essential to the nature of bodies, that it is almost impossible to form an idea of a body divested of this quality. To have a clear idea of the effect of any force upon a body, we must have a just idea of simple weight in that body; thus, a horse-power is denominated a weight of 33,000 lbs. lifted one foot high in one minute; it makes no matter what the substance may be that is lifted, nor its size, it is the 33,000 lbs. that we must fix our mind upon. It is true that the law of universal gravitation, or central attraction in bodies, lies at the root of discussing the question of weight, but as a question of *practical mechanics*, any child knows what is meant by weight—and knows the difference between one pound and five pounds. Having a just idea of the weight of bodies and their velocity (bodies in motion) we can arrive at a correct appreciation of "laboring force"—mechanical power—not otherwise. It is true that there are forces distinct from gravity, or weight—the very law of gravity, abstractly considered, is a distinct principle; but, then, we can have no clear idea of what force is, apart from its effects on bodies possessing what is known as *simple weight*. What can we know of the mechanical power of galvanism, except by the amount of pounds of metal attracted by the electro magnet? And what do we know of the power of steam except by the weight of metal in machinery that may be set in motion? And what do we know about the power of powder, except by the weight of the ball set in motion? The value of mechanical power, is the weight multiplied by the velocity: and of the weight we must judge by the mass of matter and its quality. Thus, a cubic foot of gold weighs 1,203·6 lbs.; of silver, 654·6 lbs.; of iron, 450·4 lbs.: water only 62½ lbs.

Having clearly ascertained what is commonly meant by weight, let us briefly glance at the abstract principle, or law of gravity. One cannot but be particularly struck with the different degrees of rapidity with which bodies fall through the air. A piece of gold falls rapidly, a piece of paper slowly: the common opinion of the cause of this is, that the gold is heavier than the paper, but if we beat out the same piece of gold into a thin leaf, it will fall no faster than the paper.

The question may be asked, "what is the reason that bodies fall at all?" The answer is, "there is a law of universal attraction in all bodies, the power of which is in proportion to their magnitude, and the earth attracts all lesser bodies, which come within the sphere of its influence. It is positively necessary that this law should be understood to calculate the power of a water fall for a water wheel; for, as bodies fall, their velocity is accelerated; and, as has been stated before, mechanical power is weight multiplied by velocity. The difference in the velocity of falling bodies is due to a resisting medium, the air; for a piece of lead and a piece of paper will fall with equal velocity in a vacuum.

In vacuo, neither size, weight density, nor figure, makes any difference in the velocity of its fall, all the differences in the falling of bodies in air are easily explained, by taking into consideration the resisting medium of the air. The resistance is according to the amount of surface and density. A 2 inch ball of lead falls faster than a ball of one inch, because the two inch ball has eight times the amount of matter (eight times the force to move it) while it has only four times the amount of surface of the one inch shot, to which the air offers resistance.

It is well known that the falling of an apple so affected the mind of Sir Isaac Newton, that it led to the investigation and demonstration of the attractive force of bodies. He proved the existence of such a law, by mathematical demonstration. Before his discovery it was well known that apples would fall to the ground, and that water would run from a higher to a lower lever, but to him belongs the credit of proving beyond dispute, that a principle of gravitation existed in all bodies, and that this principle was powerful according to their magnitude. The point to start from in practical mechanics, is a simple balance. By taking a pair of scales, and putting a pound weight in each, we find that both scales remain perfectly stationary, in equilibrium; but, by adding one ounce, or half an ounce, to the one scale, we behold the beam beginning to quiver—one scale to descend and the other to rise. What is the reason of this? The one that descends has a gravitating force of 17 ounces, the other that rises has only 16 ounces. The force displayed in the one is the power which raised the other. It is from this point every person should begin to estimate lever power. MACLAURIN.

Potato Rot.

I saved a fine crop of potatoes in mid New York, the last season, by using the plaster of Paris, while my neighbors lost theirs almost entirely by the rot. My best planting was an upland second crop from the sod, (I think a first crop would have been better); it was planted about the first of June, hoed once, and a handful of plaster cast over the vines immediately after hoeing. I should have cast it upon the sod, also, before cover, if I had provided it to hand. When dug from the hill, they were separated (5 per cent. only being affected and those with the dry rot only) and spread on the floor of my wagon-house, until thoroughly dry and the weather compelled me to remove them to my cellar, when they were spread out about a foot thick, over a large bin, where the air can circulate beneath; and they have kept perfectly well. Plant so late that your vines will not mature and dry up in the drought of harvest, on lands not subject to frost, and secure the full growth of large and fine tubers, use the planter freely, and you need not fear the rot. GREEN.

[This is a subject which, is of immense interest to our farmers.—ED.]

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TO CORRESPONDENTS.

"C. E. G, of N. Y."—"I recently saw a note in one of your New York papers, in answer to a correspondent, in which it was stated that there were no agents through whom patents could be obtained in foreign countries, located here. Is that correct." The Editor who made such a statement must have been poorly advised. We attend to this kind of business, and have done so for some time. See advertisement.

"F. S. McC., of Pa."—The patent of Mr. P. does not cover the entire application of the circular saw; a circular saw mill got up by any one else, if new, could be patented—other patents besides this exist.

"S. S., of Ala."—How would Mr. Wilder's press answer—the one illustrated in No. 9, this Vol. Sci. Am.? We know of no other that can be built as cheap. The principle of it is nearly the same as the one you have described to us.

"J. T., of Phila."—It is true that fish could be killed by exploding gunpowder, as they have been, but the process would be expensive and would not pay.

"J. B., of Ohio."—Copal varnish is the best hard finish we know of for wood varnish.

"H. H. T., of Mass."—You cannot gain anything by passing the cold tube through the steam chamber of the boiler. You can gain something by running it through the smoke-pipe, but not through the boiler.

"C. B., of N. H."—There are no such instruments as mineral rods sold here. You may depend upon it, that there is more superstition about the rod than truth. We don't believe in them.

"F. F. Elliott."—The machine that you want is employed by the Matteawan Co.; we do not know its price, but it combines the principles of the throstle and the mule, and is simple. You can get all the information you want by addressing Mr. Leonard, No. 66 Beaver street, N. Y.

"S. L., of Pa."—We are not acquainted with Prof. R.'s process of teaching drawing, but his advertisement seems to us tainted with humbuggery. We cannot believe that the art of drawing in perspective can be learned in one hour—one day, even—under the tuition of any professor. Perhaps the editors of the "Home Journal" have been humbugged a little; the wisest sometimes do get deceived.

"C. P. L., of Pa."—There is nothing new in an endless chain of buckets passing over pullies; the application of it to a new purpose could not be patented. We cannot see its advantages, if it has any; we could not advise you to try it.

"A. D., of Ala."—By reference to Macfarlane's work on Propellers, page 63, you will find essentially the same device as yours: the principle is too complicated, and is liable to get out of order, much more than the straight blade.

"W. L. R., of Geo."—There is no advantage gained by your device for keeping the paddles of steamboat wheels vertical in the water. Many experiments have been made, and all go to show the fallacy of moveable blades, and they are condemned by all engineers. We know you never would be able to make anything out of it, and we advise you to abandon any further attempts to bring it forward. $5 received and disposed of agreeably to your request.

"A. D., of Mich."—We are unable to arrive at a correct understanding of your improvements in separators, from the description given. You had better construct a model 12 or 18 inches square, and forward it to this office for examination. The expense for transportation must be pre-paid.

"A. L., of R. I."—We do not know where bone grinding machines are made. Would gladly give you the desired information if we possessed it.

"W. & P., of Pa."—The use of one or two parts claimed (for two years prior to the grant of patents) does not invalidate the good claims, but disclaimers should be entered as soon as possible for what is old. No person can take any one part of your machine, if a claim is set upon it, and use it in another without being liable to a suit for infringement.

"N. D., of Me."—There is nothing new in your plan. See page 137, Vol. 5, Sci. Amer.

"T. E. C., of Conn."—We cannot advise you upon the business you offer for our consideration: it is out of our line altogether.

Money received on account of Patent Office business, since Dec. 24, 1850:—

S. N. M., of N. Y., $50; M. G. & Co., of Paris, France, $20,50; R. W. A., of Conn., $30; E. G., of Mass., $10; I. B. L., of Vt., $25; J. S., of Mass., $25; T. S., Jr. of Conn., $30; D. E. S., of O., $20.

Patent Claims.

Persons desiring the claims of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office; stating the name of the patentee, and the year the patent was granted (adding the month of the year when convenient), and enclosing one dollar as fee for copying.

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Those desiring Volume 5 of the Scientific American, are informed that we are able to furnish a few complete volumes, (bound,) at $2,75 each. Also, we can send by mail sets complete, (unbound,) for $2. We would also say, that whenever our friends order numbers they have missed—we shall always send them if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

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Patent Office.

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Arrangements have been made with Messrs. Barlow, Payne & Parken, Patent Attornies, in London, for procuring Letters Patent in Great Britain and France, with great facility and dispatch.

MUNN & CO.,
128 Fultonstreet, New York.

WORLD'S FAIR, LONDON, in 1851—ANDREW P. HOW, Civil Engineer and Machinist, 35 Mark Lane, London, England. Mr. How is a native of the United States, in the above named business in the city of London. He offers his services to those of his countrymen who may have any kind of steam or other machinery to be exhibited at the Great Fair. He will, if required, receive it on arrival, and do all that may be necessary towards its erection, &c. References in New York—Thos. Sewell, 701 Broadway; Joseph Barton, 516 Grand st.
16 8*

SHARE OF A VALUABLE PATENT RIGHT FOR SALE.—In consequence of the inventor of a valuable patent not having time to devote to the working thereof, a small share of the patent is now offered for sale on most advantageous terms. The purchaser must be a person of respectability and of smart business habits, and willing to proceed immediately on the sale of rights, at a liberal commission. Apply by letter, pre-paid, to A Z, box 1334, Post Office, New York.

We are perfectly acquainted with the nature of the above patented invention, and are of opinion that it is one of value and merit. MUNN & CO. 16 2*

PATENT RIGHTS FOR SALE.—The undersigned, having received letters patent Oct. 22nd, 1850, for a valuable improvement in Straw, Stalk, and Cane Cutters, is desirous of disposing of rights to parties, to make and sell the same. Cash or, if preferable to the purchaser, available Western lands will be taken in payment. See engraving in Vol. 5, No. 7, Sci. Am. H. W. BERTHOLF,
26 2* Sugar Loaf, Orange Co., N. Y.

STRAW CUTTER FOR SALE.—We have on hand one of Macomber's Improved Straw Cutters, patented Nov. 5, 1850, illustrated in No. 50, Vol. 5, Sci. Am. Price $10. Address MUNN & CO.

FOR SALE—A good second-hand Steam Engine, 8 inch cylinder, 32 inch stroke, with one boiler, 3 feet diameter, 22 feet long, with one 16 inch flue, refitted in good order. CHUTE, BROTHERS,
13 4* Schenectady, N. Y.

HUTCHINSON'S PATENT STAVE MACHINE.—C. B. HUTCHINSON & CO., Waterloo, N. Y., offer for sale town, county and State rights, or single machines, with right to use the same. This machine was illustrated in No. 2, Vol. 5, Sci. Am.; it will cut from 1,500 to 2,000 perfect staves per hour. We manufacture machines of different sizes, for keg, firkin, barrel and hogshead staves; also, heading shingle, and listing and jointing machines. These machines may be seen in operation at St. Louis, Mo.; Chicago, Ill.; Savannah, Ga.; Madison, Ia.; Ithaca, N. Y.; Waterloo, N. Y.; Bytown, C. W. Letters directed to us, post-paid, will receive prompt attention.
15 3m*

LEONARD'S MACHINERY DEPOT, 116 Pearl st., N. Y.—The subscriber has removed from 66 Beaver st. to the large store, 116 Pearl st., and is now prepared to offer a great variety of Machinists' Tools, viz., engines and hand lathes, iron planing and vertical drilling machines, cutting engines, slotting machines, universal chucks, &c. Carpenters' Tools—mortising and tennoning machines, wood planing machines, &c. Cotton Gins, hand and power, Carver Washburn & Co.'s Patent. Steam Engines and Boilers, from 5 to 100 horse power. Mill Gearing, wrought iron shafting and castings made to order. Particular attention paid to the packing, shipping, and insurance, when requested, of all machinery ordered through me. P. A. LEONARD.
15 2m

TO IRON FOUNDERS, &c.—Fine ground and bolted Foundry Facing, viz.: Sea Coal, Charcoal, Lehigh, Soapstone, and Black Lead. Fire Clay, Fire Sand, Kaoline, and Fire Brick; also Iron and Brass Founder's superior Moulding Sand, in barrels, or otherwise, for sale by G. O. ROBERTSON, New York. City Office, 4 Liberty Place, Liberty street, near the Post Office. 13 5*

WATER-PROOF BLACKING—G.R. Townsley having received Diplomas from the various Fairs, where his celebrated Water-proof Blacking has been exhibited, takes this method of informing the public that he continues the manufacture of it at Springfield, Mass. Each box of blacking contains a suffieient quantity to last one person for six months, and it is warranted to render boots impervious to water, gives a good polish, and is a preservative to leather. Address G. R. TOWNSLEY, Springfield, Mass., or H. E. WARREN & CO., Agents, 44 Courtland street. A sample may be seen at this Office. 13 4*

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1 1-4 to 7 inches in diameter. The only Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine, and other Steam Engine Boilers.
THOS. PROSSER & SON, Patentees,
8tf 28 Platt st., New York.

AMERICAN CAST-STEEL.—The Adirondac Steel Company have re-built their works that were recently destroyed by fire, and are now manufacturing an improved article entirely from home material, as low in price, and warranted equal to any imported steel in market. All sizes Steel, from 1-4 inch to 4 inches square, and from 1-2 inch to 12 inches wide, can be supplied. For sale at the Company's Warehouse, by QUINCY & DELAPIERRE,
14 4* 81 John st., N. Y.

BARNUM'S PATENT PLANING MACHINE.—These machines, while they possess equal facilities with any other, for planing coarse lumber for flooring, &c., removes all the objections urged against machine planing, for ship and steamboat building, or fine ceiling, &c., by finishing the material with the grain, fully equal to hand planing, leaving no indentations on the surface of the board (as in all machines using pressure roll-ers in planing, by the chips and knots collected passing between the planed surface and weighted feed rollers, thereby destroying fine work, designed for painting, &c.) as there is no appliance whatever on the planed surface. Contracts may now be made for their construction or use, or for the formation of a joint stock company or companies, in any part of the U. S., to successfully prosecute the business by applying to DANIEL BARNUM, Snowden's Wharf, Philadelphia, where the machines may be seen in constant operation. 14 6*

DICK'S GREAT POWER PRESS.—The public are hereby informed that the Matteawan Company, having entered into an arrangement with the Patentee for the manufacture of the so-called Dick's Anti-Friction Press, are now prepared to execute orders for the following, to which this power is applicable, viz.—Boiler Punches, Boiler Plate Shears, Saw Gummers, Rail Straighteners, Copying and Sealing Presses, Book and Paper Presses, Embossing Presses, Presses for Baling Cotton and Woollen Goods—Cotton, Hay, Tobacco, and Cider Presses; Flaxseed, Lard, and Sperm Oil Presses; Stump Extractors, &c. &c. The convenience and celerity with which this machine can be operated, is such that on an average, not more than one-fourth the time will be required to do the same work with the same force required by any other machine.
WILLIAM B. LEONARD, Agent,
13tf No. 66 Beaver st., New York City.

TO TIN PLATE AND SHEET IRON WORKERS.—ROYS & WILCOX, Mattabesett Works, East Berlin Station, on the Middletown Rail Road, manufacture all kinds of Tools and Machines of the best quality, both in material and workmanship. This establishment being the only one where both tools and machines are manufactured, superior inducements are offered to the trade; all work warranted, with fair use. Agents in most of the principal cities of the United States and Canada. Orders promptly attended to. F. ROYS,
E. WILCOX.
Berlin, Conn., Nov. 1, 1850. 7 1am1y

WATER POWER FOR SALE OR TO LEASE—55 miles from New York, and 3 miles from the Harlem R. R. Depot at Croton Falls. There is a never-failing stream of water, with a fall of 200 feet in one-third of a mile, and about 150 horse power, without any cost of damming or danger from floods. It is a fine situation for a series of small manufactories and mechanic employments requiring motive power. There are on the premises, consisting of 11 acres of land, a grist and plaster mill, with three runs of stone, and a dwelling house. The country is healthy, fruitful, and picturesque. Enquire of T. R. LEE, Croton Falls. 15 6*

UNITED STATES PATENT OFFICE IN PARIS AND LONDON.—GARDISSAL & CO., 9 Arthur st., west, city, London; Paris, 29 Boulevard St. Martin.—Procuration of Patents for England, Ireland, Scotland, France, and all countries; and transactions of all business relating to patents, (sale and licenses,) specifications, oppositions, &c. "The Invention," monthly journal, $1 a-year. 15 4m*

GURLEY'S IMPROVED SAW GUMMERS—for gumming out and sharpening the teeth of saws can be had on application to G. A. KIRTLAND, 205 South st., N. Y. 10tf

SCRANTON & PARSHLEY,—New Haven, Conn., will have finished by the 15th of December, 12 Engine Lathes of 8, 10 and 12 feet beds, and weigh 1500, 1650, and 1800 lbs; price $200, $220 and $240. These Lathes are from a new set of patterns, and are greatly improved from their former small size lathes; they swing 21 inches, and have back and screw gearing, centre rest, follow rest, drill, chuck and overhead reversing pulleys, all hung in a cast iron frame, ready for use. On and after the first of Dec., by addressing as above (post paid) cuts can be had of these, with index card, showing the different pitch threads that these lathes will cut.

Two of the power planers heretofore advertised in this paper, are now ready to ship to the first order; they weigh from 4500 to 4600 lbs., when finished. 9tf

A CARD.—The undersigned begs leave to draw the attention of architects, engineers, machinists, opticians, watchmakers, jewellers, and manufacturers of all kinds of instruments, to his new and extensive assortment of fine English (Stubs) and Swiss Files and Tools, also his imported and own manufactured Mathematical Drawing Instruments of Swiss and English style, which he offers at very reasonable prices. Orders for any kind of instruments will be promptly executed by F. A. SIBENMANN, Importer of Watchmakers' and Jewellers' Files and Tools, and manufacturer of Mathematical Instruments, 154 Fulton street. 1 6m*

TO PAINTERS AND OTHERS.—American Anatomic Drier, Electro Chemical graining colors, Electro Negative gold size, and Chemical Oil Stove Polish. The Drier, improves in quality, by age—is adapted to all kinds of paints, and also to Printers' inks and colors. The above articles are compounded upon known chemical laws, and are submitted to the public without further comment. Manufactured and sold wholesale and retail at 114 John st., New York, and Flushing, L. I., N. Y., by QUARTERMAN & SON,
9tf Painters and Chemists

MACHINERY.—S. C. HILLS, No. 12 Platt Street, N. Y., dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills Kase's, Von Schmidt's, and other Pumps, Johnson's Shingle machines, Woodworth's, Daniel's and Law's Planing machines, Dick's Presses, Punches, and Shears; Morticing and Tennoning Machines, Belting, machinery oil; Beal's patent Cob and Corn Mills; Burr Mill, and Grindstones, Lead and Iron Pipe, &c. Letters to be noticed must be post paid. 10tf

BAILEY'S SELF-CENTERING LATHE, for turning Broom and other handles, swelled work, chair spindles, &c.; warranted to turn out twice the work of any other lathe known—doing in a first rate manner 2000 broom handles and 4000 chair spindles per day, and other work in proportion. These lathes are simple in construction, not liable to get out of repair, and will do enough more than other lathes, in three months' use, to pay their cost. One of them may be seen at the office of Munn & Co., New York. Price of Lathe for turning broom and hoe handles, rake stales, scythe snaths, windsor and cottage chair legs and pillars, $100, with one set of tools; $125 with two sets. Lathe for turning chair spindles, whip stocks, gun rods, &c., complete, $75. Orders, post-paid, may be forwarded to L. A. SPALDING, Lockport, N. Y. 9 3m

IMPORTANT NOTICE TO CONFECTIONARY MAKERS—Whereas, a patent was granted to the undersigned, Oct. 8th, 1850, for an improvement in the manufacture of Comfits, and from certain knowledge which he has received, he believes that parties are using it without his consent. Vigorous measures are now being taken to ascertain who the unprincipled parties are, in order that they may be dealt with according to law. This notice is to warn all not to infringe the patent, as it is not the intention of the patentee to dispose of rights. Parties using it will have no authority. W. H. HOLT, Patentee.
Hartford, Conn., Nov. 25, 1850. 11 8*

THE SUBSCRIBER is now finishing four 14 horse engines, with boiler and apparatus all complete—price $1200 each. Several 6 horse engines extremely low; also, several of smaller capacity, complete; also, several power planers, now finishing.—Galvanized chain for water elevators, and all fixtures—price low—wholesale and retail. Orders, post-paid, will receive prompt attention. AARON KILBORN.
No. 4 Howard st., New Haven, Conn. 11 6*

FOREIGN PATENTS.—PATENTS procured in GREAT BRITAIN and her colonies, also France Belgium, Holland, &c., &c., with certainty and dispatch through special and responsible agents appointed, by, and connected only with this establishment.—Pamphlets containing a synopsis of Foreign Patent laws, and information can be had gratis on application
JOSEPH P. PIRSSON, Civil Engineer,
7tf Office 5 Wall street, New York.

RAILROAD CAR MANUFACTORY.—TRACY & FALES, Grove Works, Hartford, Conn. Passage, Freight and all other descriptions of Railroad Cars, as well as Locomotive Tenders, made to order promptly. The above is the largest Car Factory in the Union. In quality of material and in workmanship, beauty and good taste, as well as strength and durability, we are determined our work shall be unsurpassed. JOHN R. TRACY,
16tf. THOMAS J. FALES.

FOWLERS & WELLS, Phrenologists and Publishers, Clinton Hall, 131 Nassau st., New York—Office of the Water Cure and Phrenological Journals. Professional examinations day and evening. 3 6m

MANUFACTURERS' FINDINGS and Leather Binding.—The subscriber is prepared to offer a large assortment of manufacturers' Findings for Cotton and Woollen Factories, viz., bobbins, reeds, harness, shuttles, temples, rockers, harness twines varnish, roller cloth, card clothing, card stripper and clamps, calf and sheep roller, leather, lace, and picker string, potato & wheat starch, oils, &c. Leather Banding, of all widths, made in a superior manner from best oak tanned leather, rivetted and cemented.
15 3m P. A. LEONARD, 116 Pearl st.

PATENT RIGHTS FOT SALE.—The inventor of the atent "Cut-Off," illustrated in No. 14, Scientific American, desires to effect sales of rights—town, county and State rights will be sold on reasonable terms. Address G. B. MILNER, Houston, Texas, post-paid. 15 4*

TO IRON FOUNDERS AND MACHINISTS in the Northern and Eastern States.—The Subscriber, sole agent for the sale of rights to make and sell the celebrated Bogardus Horse Power, will contract with any one disposed to manufacture the best horse power in the world, upon reasonable terms. Address GEORGE VAIL, Morristown, N. J.
1am 1y*

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Scientific Museum.

Metal Reduction.

It is stated, apparently on good authority, that a French chemist, M. Chaudron-Junot, of Bussy, has succeeded in reducing to the metallic state, by exceedingly easy means, a great many bodies which have not hitherto been seen in that condition. He classes his substances in two series :—the first comprehends silicium, tantalum, titanium, chromium, tungsten, molybdenum, and uranium,—the second embraces magnesium, aluminum, and barium. The metals in the first series are completely inoxidizable, and perfectly resist the action of strong acids; and some of them are not affected by even the nitro-muriatic acid, which it is well known dissolves even gold and silver.

It is expected that these will replace platinum in many of its applications,—their cost, it is stated, being 30 per cent less than the cost of that metal. The second series are not affected by a dry or moist atmosphere, though they are acted on by acids ; and it is proposed to apply them to many purposes of ornamentation, for which silver is now employed. These metals are all white,—the degree of whiteness and brilliancy varying from that of platinum to that of the purest silver. The reduction of silicium is said to be beautifully perfect; and we are told that the Minister of Commerce has taken the most lively interest in the progress of M. Chaudron-Junot's discoveries.

[The above is from the London Athenæm, but, as a drawback upon its plausibility, we would state that these metals are found in nature as oxides, oxidized.

Petrifying Fountain.

One of the most curious sights of Claremont, Switzerland, is what is vulgularly called the petrifying spring, in the Faubourg St. Alyre. This is a fountain, which contains so large a portion of carbonate of lime, as to incrust, in a very short time, any object placed within it. In the course of ages it has formed a bridge of tufa of great length and thickness, at the rate of three inches annually. The water is collected in two large tanks, from which it drips into two chambers furnished with shelves. On these are placed various objects for incrustation. Stuffed monkeys, parrots, dogs, cats, and birds were in different stages of transition; some nearly covered by the stony coat, others with their fur or hair delicately powdered, wearing a grisly appearance. The largest animal was a donkey, whose back and sides were coated. Fruits and the most delicate plants were undergoing the same process.—The sediment deposited is so fine, that it is perfectly practicable to obtain the sharpest casts from moulds. The water is used also for bathing purposes. I was rather amused by the pains taken to impress upon me that no danger of being turned into a stone during the proces of taking a bath was to be feared. It appears, however, that some individuals are apprehensive of such a calamity, for they assign it as a reason for not availing themselves of the baths.—[Travels in Avergne.

Fashionable Diseases.

A few years ago dyspepsia was very fashionable, but now it is so old fashioned that we hear but little about it, and no hobby rider thinks in the present day of setting up any pretensions to great skill in the treatment of this complaint. Diseases of the throat have taken its place in the public mind, and multitudes are running to those who are reputed to have particular skill in clipping off tonsils and palates, and swabbing out windpipes. The new treatment, as it is called, is good practice in some cases, but the almost indiscriminate application which some hobby doctors make of it is ridiculous and contemptible. —[Dr. Bentley's Physician and Patient.

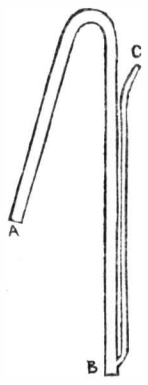
It is said that some American wool, recently sent from New York to England, proved to be so exquisitely fine as to make it impossible to card it with the present machinery. It was fine enough to have imitated the cashmere.

Hydrostatics.

(Continued from page 120.)

The pressure of the atmosphere is 15 lbs. upon every square inch of the earth's surface. This pressure is capable of supporting a co-column of water 30 feet high When a vacuum, therefore, is formed in a pipe dipping into water—that is, by extracting the air, the water will rise in the pipe, as the air is pumped out. The discovery that water could not be raised from a well deeper than thirty feet by the common pump, was made in Galileo's day, and when he was pressed for a reason he could not give a correct one. The cause is now well known, and advantage is taken of this law, in conveying liquor from one vessel to another, by a simple instrument named the

Fig. 15.

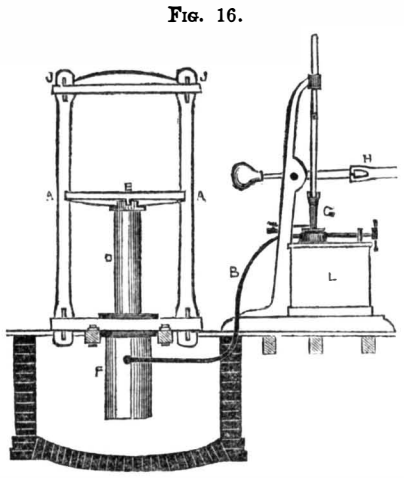


syphon. It is a bent tube, A B, with a small tube, C, soldered to one leg. Common syphons have not an additional tube, and they are just as good as the one represented, unless for decanting valuable liquors.

The additional tube of this syphon is open at the upper end, communicating with the long leg. The short leg being plunged into the vessel of liquor, the mouth of the long leg is to be stopped with the hand, and, by suction at the end of the small tube, the air will be extracted from the syphon and the liquor will rise from the vessel into the vacuum, and will flow over the bend, and out of the long leg. The liquor cannot be carried higher than thirty feet; it is upon this principle the suction of a fire-engine acts—it cannot draw water from a greater depth than thirty feet.

In using the syphon, whenever the liquor in the vessel, from which it is drawing, falls to the level of the mouth of the exit tube, the liquor will cease to flow, upon the principle of the equilibrium of fluids. The liquor, rushing up the tube, cannot press upon the bottom of the vessel, thorefore, if the syphon is sustained by hand, so much weight of water as there is in the syphon is taken off both sides and the bottom of the vessel. The syphon is a very useful instrument, and to test the principle of its operation by atmospheric pressure, the amateur philosopher has but to try and draw off boiling water from one vessel into another. As the steam and the atmosphere are at equilibrium at the surface of the water, no pressure of the atmosphere can force the water up the leg of the syphon ; the syphon, therefore, will not act. We have not seen this experiment mentioned in any work on Natural Philosophy.

Fig. 16.



Hydrostatic Press.—This press is the invention of the celebrated Mr. Bramah. The principle on which it is founded depends upon the equilibrium of pressure in fluids. It was patented in 1791, in England; it is now employed for pressing cotton, hay, tobacco, goods of every kind, testing the strength of cannon, cables, girders, &c., and by two presses, the ponderous tubes, each weighing 1,400 tons, of the great Britannia Tubular Bridge, were raised 100 feet high.

Fig. 16 represents a press for packing goods, &c. F is a strong iron cylinder, accurately bored and fitted with a solid piston, C. A A are two strong iron sides, united by cross-heads, J J. E is a strong iron seat plate, into which the piston, D, is snugly fitted ; L is the cistern of the forcing pump; B is a small pipe connecting it with the cylinder, F. This constitutes the entire principle of the press, for whatever pressure is exerted on the small area of the valve, where the pipe enters the cylinder, that amount of pressure is multiplied in the press as many times as the area of the plunger exceeds that of the valve. The pump does not differ essentially from another forcing pump. It has a conical valve below, to admit water from the cistern when the plunger is raised, and another opening towards the pipe, B, to admit the water when under the action of the plunger, into the pipe and cylinder. It is also supplied with a steelyard safety-valve for relieving the press, and a faucett for returning the water into the cistern when the operation is completed. H is the lever, and G is the plunger rod.

The operation of this press may be very readily comprehended, by supposing the pump, cylinder, and connecting pipe, B, to be filled with water, and that an adequate supply of water is contained in the cylinder, L. When the handle of the lever, H, is raised, it brings up the piston rod, G, which would leave a vacuum beneath, if the atmosphere did not force the water through the lower or suction valve of the pump. The lever being then pressed down, the piston rod, by descending, diminishes the capacity of the pump; this causes the lower valve to shut, and forces the water through the other valve, whence it passes by the pipe, B, into the cavity of the great cylinder, F, and raises the piston, D, and pressing table, E, together with its load, a distance proportioned to the quantity of fluid injected. On the subsequent rise of the piston of the pump, the descent of the upper valve prevents the return of the water, and consequently the fall of the cylinder, D. A repetition of the same process injects more water, and the pressure may, in this manner, be carried to a great extent. When it is proposed to relieve the action of the press, the discharge valve must be opened by turning the screw back; the water then escapes out of the press into the cistern, L, and consequently the table, E, and the cylinder, D, descend by their weight, restoring the engine to its original situation.

No Coal in California.

Mr. P. T. Tyson, of Baltimore, as the result of a scientific visit to the late Territory of California, effectually contradicts the reports of a plentiful supply of coal there, in a communication to one of the Departments at Washington; and it seems likely, he says, that the same geological features extend from near the Oregon boundary to the southern terminus of Lower California. An inspection of the various localities where coal has been reported to exist, proved that every one of those beds described as of "the best quality for steaming," were composed of either lignite or bitumen, or something or other still further removed from the character of coal. It is to Vancouver's Island, Mr. Tyson says, that California must look for supplies, unless they may be obtained from Oregon. Great Britain showed penetration and cuteness in her transaction with America, whereby she won from us that noble Island, which has since been sold to the Hudson Bay Company—a grievous wrong for which she will yet be sorry. Vancouver's Island is to the western part of our Continent what Britain is to Europe, in respect to position and natural resources.

Bisulphate of Lime.

The Planters' (La.) Banner says :—Quite a number of our planters are experimenting with the bisulphate of lime in sugar making, but we can hear of none who, after a fair trial, appear to be sure that it is doing much for the planter. Something may eventually be made out of the discovery, but up to the present time we are satisfied that no great advantages have been derived from it.

LITERARY NOTICES.

Peterson's Ladies' National Magazine, for January comes to us through Messrs. Dewitt & Davenport : it contains 72 pages of choice literature, besides several fine embellishments, the most prominent of which is, "Pray God to bless Papa and Mamma :"—the scene represents a child in the attitude of prayer before its mother, receiving the impressions of God's over-ruling care and watchfulness. It illustrates a great example—one which should not be lost sight of in a family. This Number is a good one.

Sartain's Union Magazine, for January, contains a beautiful mezzotint of The Mother and Child, by Mr. Sartain, after a design by Sir Thomas Lawrence; "Preparing Moses for the Fair," from Goldsmith's Vicar of Wakefield, is a fine picture. The frontispiece is an illuminated page of the Seasons, executed in Chromo-Lithography by Domdorf. Besides these it contains over 20 engravings, some of which are scenes in the Life of Christ. Some of the first authors in America have contributed to this number—it is very rich. Dewitt & Davenport, Agents.

Graham's American Magazine, for January is received through Messrs. Dewitt & Davenport; it is richly embellished and well laden with choice matter. "The Source of Prosperity" is a beautiful line engraving, by Tucker; "Union Park, New York," by Smillie, is well done. Mr. James contributes an interesting story; Bryant, Longfellow, Willis, and a host of others, are announced as regular contributors to this volume. Graham is determined not to be outdone. This number is a very fine one in every respect.

Holden's Dollar Magazine, for January, commences the Seventh Volume : it contains a view of the Hudson River, at Anthony's Nose, and a likeness of Rev. Thomas O. Summers, D. D., accompanied by an interesting article by Sigma. It would be supererogation in us, to speak in favor of this Magazine ;—our readers well know what we think of it. It is by far the cheapest magazine in the world, the price being only $1 per year. Fowler & Deitz, N. Y.

No. 29 Shakspeare's Dramatic Works, Phillips, Sampson, & Co., is upon our table : it contains "Coriolanus," embellished with a portrait of the modest Virgilia. This work, when complete, will be exceedingly beautiful. Dewitt & Davenport, agents.

Law Magazine.—No. 1, Vol. 3, of this able monthly magazine, by John Livingston, 54 Wall street, this city, contains an excellent steel portrait, and biographical notice of Judge Cranch, of Washington. It opens with a most able essay on "The Practice of the Law," an essay which should be read by every student of the profession. It also has an able essay on the "Legal Profession in the United States," and "Notes on Recent Leading American Cases." This last part is a peculiar and invaluable feature of this Magazine; we esteem it very highly. The price is $5 per annum.

Messrs. Fowlers & Wells, 131 Nassau st., have sent us three volumes, embracing O. S. Fowler's Treatise upon Memory, Self-Culture, Physiology—animal and mental. These volumes contain some of the most valuable advice ever imparted to youth, and we would gladly find them in the library of every family in the country. They embrace about 300 pages, each of well printed valuable matter.

MECHANICS

INVENTORS
AND
MANUFACTURERS.

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IN THE WORLD!
SIXTH VOLUME OF THE
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The Publishers of the SCIENTIFIC AMERICAN respectfully give notice that the Sixth Volume of this valuable journal, commenced on the 21st of September last. The character of the Scientific American is too well known throughout the country to require a detailed account of the various subjects discussed through its columns.

It enjoys a more extensive and influential circulation than any other journal of its class in America.

It is published weekly, as heretofore, in *Quarto Form*, on fine paper, affording, at the end of the year, an *ILLUSTRATED ENCYCLOPEDIA*, of over FOUR HUNDRED PAGES, with an Index, and from FIVE to SIX HUNDRED *ORIGINAL ENGRAVINGS*, described by letters of reference; besides a vast amount of practical information concerning the progress of SCIENTIFIC and MECHANICAL IMPROVEMENTS, CHEMISTRY, CIVIL ENGINEERING, MANUFACTURING in its various branches, ARCHITECTURE, MASONRY, BOTANY,—in short, it embraces the entire range of the Arts and Sciences.

It also possesses an original feature not found in any other weekly journal in the country, viz., an *Official List of PATENT CLAIMS*, prepared expressly for its columns at the Patent Office,—thus constituting it the "*AMERICAN REPERTORY OF INVENTIONS.*"

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10 " 12 " $15 | 20 " 12 " $28

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PREMIUM.

Any person sending us three subscribers will be entitled to a copy of the "History of Propellers and Steam Navigation," re-published in book form—having first appeared in a series of articles published in the fifth Volume of the Scientific American. It is one of the most complete works upon the subject ever issued, and contains about ninety engravings—price 75 cents.

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